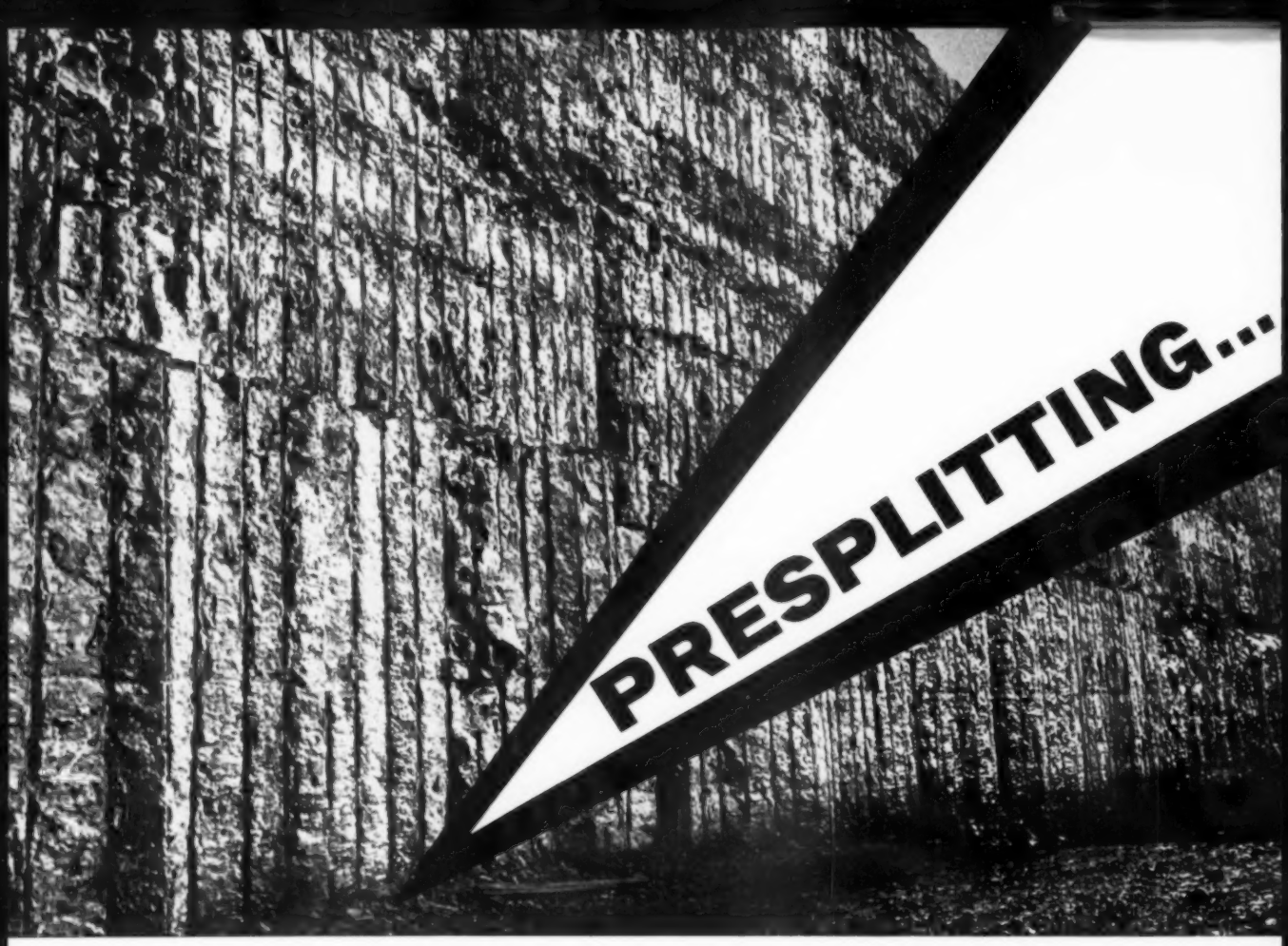
Excavating Engineer

founded 1905

JUNE
1961

Longest range stripping shovel mounted on two crawlers uncovers coal in the Panther pit of Green Coal Co., Owensboro, Ky. See story on page 25.



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founded 1905

P. O. Box 56
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R. L. SMITH
Publisher

H. A. BURKHARDT
Manager

W. C. VAN DYKE
Sales Manager

W. E. WILLIAMS
Editor

F. C. GROTJAN
Assistant Editor

E. W. ARNDT
Art Editor

H. LINDQUIST
F. W. MOVROYDIS
Staff Photographers

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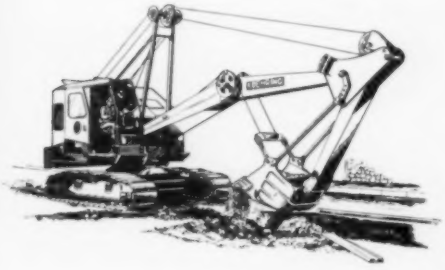

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JUNE 1961

Miami Catches Up Fast On Its Expressways

From a slow start just three years ago, Florida's largest city sprints ahead today with almost $50 million worth of expressway work. Planning ingenuity, contractor know-how spark the effort.

Part I of a series of four articles.

ONE of the biggest tourist attractions in Florida this season is a construction project—the sprawling Miami expressway system. The spectators who crowd the sidelines at the busy jobsites aren't run-of-the-mill sunseekers on a day off from their chaise lounges at the beach. No, these men are mostly vacationing contractors, pulled away from poolside by the lure of a novel pipelaying operation; by the chance to check an up-to-the-minute grading idea; or by the need to know more about an interesting pile-setting gimmick.

They find all this—and more—along the wide right-of-way that cuts a ragged swath through rows of bungalows lining the city's streets. Seldom has so much road work, with such variety of problems, been concentrated in so small an area. Stand atop Miami's "stack"—the multi-level 36th Street interchange. A sweep of the horizon takes in expressway contracts worth almost $20 million. Within easy ten minute drive from here you can find another $30 million worth of highway work connected with this growing net. And yet another $50 million is on the boards, ready to go.

But what stops the road builder with Ohio plates on his car is a glimpse of a hoe digging rock right behind a huge ditcher. That's one way contractors here have doubled trenching speed in tough coral sub-

Crane teamwork moves concrete for deck pour far out on a causeway bridge. Northwest crane in the foreground picks up the bottom-dump bucket and relays it to the barge-mounted Whirley. Floating rig then dumps the mix in the deck forms.

Memo to: Excavating Engineer
From: Your Roving Reporter

KNOW the rewarding part of this job? Not just the breaks, like a midwinter field swing through Florida. Rather, it's the chance, once in a while, to discover something new and exciting. Like a cheaper way to move a yard of dirt. Or a better way to put up a bridge. Or an easier way to handle a ton of rock.

In that respect, covering progress of the interstate highway system has been a real ball. *Excavating Engineer* has visited the best of these projects from Milwaukee to Mobile, from Connecticut to California. The worry begins to creep up in this fifth year of the I-era: Maybe the last word has been written on smart gimmicks to help roadbuilders get more from their machines—and more for their money.

Then comes an assignment like the Miami expressways. What a goldmine of worthwhile shortcuts! What a bonanza of cost-cutting ideas! What an opportunity for in-depth study of men, machines and methods.

Office Calls

As it turned out, "in-depth" meant just that. Inches of gooey muck covered part of the route traveled to gather facts for these stories. The path also led to sparsely furnished field shanties where state engineers and job supers plotted their day-by-day operations. It included stops at more sumptious offices, like those of the resident engineer for all interstate work in the Miami area.

The search reached far out. To the state capitol in Tallahassee, where Walter Revell, director of information for the road department, offered a treasure of background data. To Bartow, where the files of Wade Blake, engineer of photography for the SRD, yielded some top-notch aerial views of work in progress.

What's to show for all the time and travel? New ideas. Money-making ideas that can benefit any modern road-builder—whether he does the whole job from subgrade to signposts, or just hauls in borrow; whether he's big enough to take a seven-figure job in stride, or just setting his sights on that plateau.

So here it is—an anatomy of an expressway. If one contractor gets from it one idea that helps him earn fair profit this season, then the foot-by-foot survey of the route and the long hours of research were all worthwhile.

soil. The builder attending a convention at nearby Miami Beach rents a car. He parks and takes notes while a couple of cranes swing 40-ton beams aloft for a bridge that's laid out on a curve, with wild skew angle and superelevation to boot. He comes away amazed at how a single twist of the beam grinds flat perfect bearing surfaces on the caps.

Why the wealth of advanced engineering displayed here? Why so much construction ingenuity on one job? There are a couple of good reasons:

1. Tight timetable—By the summer of 1961, over five miles of Miami's urban interstate routes will be under traffic. By the end of the year, another five miles should be just about finished. Yet most of this work had to be crammed into a construction period spanning less than 36 months.

The contractors didn't sit around and complain about streets crowded with strings of haul trucks, or foul-ups at the common borrow pit. They juggled haul times to take advantage of light traffic hours. They figured new ways to move and place super-size girders. They scheduled and rescheduled work to leapfrog houses still sitting on the right-of-way or utility crews still stringing bypass lines. They devised punches and drills to spur pile-driving rates.

On its part, the state road department came up with a few neat time savers. Like precast retaining walls that fit together fast as a boy's erector set. Or simple culverts carved from solid rock and capped with concrete panels.

2. Tough job conditions—The contractors got it from all sides here. From earth and sky, from passing

Self-steering dolly brings up the rear as a 98-ft. long prestressed concrete beam arrives at a bridge site. Lever in the co-pilot's hand swings dolly's front axle so the long load can turn tight corners in city streets.

motorists and nearby homeowners, too. Water trouble cropped up below (spongy coral that leaked like a sieve) and above (torrential rains that sluiced yards of fill into newly laid drains).

But for every headache, they came up with a quick remedy. Many of the construction shortcuts are brand new. All display the cost-cutting wizardry you expect of a good contractor when the going gets real tough.

What goes into a big expressway net like this? The quick answer—lots of dirt, concrete, stone, and re-bars—is only partly right. Other things must be considered. An expressway takes planning. It also takes money. And it involves people; their homes, their businesses and their way of life. An expressway also produces creative thinking on the part of designers and builders alike.

Paper Mountains

Before a road job reaches the stage where it can be measured in terms of dirt, steel and cement, it involves a lot of paperwork. Almost as much, some experts say, as the materials of construction that go into the project.

So it seems on the Miami expressway system. The banks of blueprints lining the walls of the drafting room at the SRD district office are just part of it. Downtown at the metropolitan Dade county planning office another crew plots future links of the over-all network. And the road department engineers at the state capital pin down details of soon-to-be-let sections.

But piecing it all together, here is how the picture looks:

Current work is aimed at breaking the worst of the city's traffic bottlenecks. One of these is the exit from the Florida turnpike. Here streams of cars leave the 65-mph superhighway and crawl the rest of the way downtown, or to the beaches across the bay, on traffic-choked local streets.

So the main stem of the system (the so-called North-South expressway) is an eight-lane limited-access highway running from the turnpike to NW 36th Street. Here, like the bar on a cross, superhighways carry traffic east to Miami Beach, and west to the city's airport. The east spur of the 36th Street expressway includes the already finished Julia Tuttle causeway across Biscayne Bay. The west spur will be a dime-a-head toll road leading directly to the terminal area at Miami International Airport.

Complex interchange at 36th Street looks like a bridge designer's nightmare. The loops and ramps will carry high-speed traffic movements between two main branches of the Miami expressway system.

At the junction of the North-South and 36th Street expressways is Miami's "stack." This three-level interchange, a complex of ramps, loops and bridges, covers a 90-acre area. Its function: to smooth through, cross or turn movements of high-speed traffic.

To trace the expressway route south of the stack you need a crystal ball—or a look at the vast scale model in the planners' offices. Perhaps the crystal ball is best. For this is stuff to build dreams on. The vast center-city plan features traffic-free shopping malls, new skyscraper parking garages, revamped parks, and, of course, wide expressways to bring traffic smoothly to and from the "Magic City" center.

The expressways already live on blueprints and spec sheets. The North-South expressway will continue south from the stack, skirting just to the west of the city's heart. Then it will vault over the Miami river on twin high-level bridges, to hook up

with main arteries to the south. Work on this section of the highway net is ready to go as soon as a legal hassle over bond issues is settled.

Now look at some of the materials needed to build current sections of the expressway:

• Dirt—This problem puzzled designers as they sketched the outlines of the first expressway projects: They needed some 8 million yards of fill to build up bridge ramps, embankments, and to replace unstable soil. Yet they could depend on nary a yard from cuts along the right-of-way. A king-size borrow pit? Out of the question within economical haul distance of the job.

Bay Dredged

The answer was disarmingly simple. Most of the fill came from the bottom of Biscayne Bay. It was the largest dredging operation since developers raised whole island colonies during the heyday of the Miami Beach boom.

Mountains of borrow were pumped up alongside the fill for the Julia Tuttle causeway—a spur of I-95 that crosses the bay to Miami Beach. The location was ideal. Trucks used the causeway as a direct haul road between the borrow area and the jobsites.

R. H. Wright, Inc., prime contractor on the borrow stockpile, subbed out the dredging work to Construction Aggregates Corp. A giant hydraulic dredge, towed from Venezuela, ranged the shallow waterways of the bay, pumping sand and shells to 70 acres of stockpiles built up above water level in thin lifts. The broad plateaus of fill material grew swiftly to 30-ft. height.

Then, as contractors needed the borrow for their grading crews, they stationed draglines atop the stockpiles to load out haul trucks. Wright used a Lima rig, with 2½-yd. basket-type bucket, to slice away the sides of the fill hill. A. J. Capeletti, rushing dirt for a wet section of subgrade, put two Northwest No. 6's, rigged with 2½-yd. buckets, on the assignment.

Typical loading cycle cut all waste motion of the draglines. They toed the edge of the stockpile, facing the truck almost head on. (No worry about solid ground support under the draglines on this stable hydraulically placed material.) Then, quick as 1-2-3, the bucket shaved off a heaping payload from the side of the stockpile, swung out to boom-tip length, and tipped neatly into the body of a waiting hauler. Each 2½-yd. dragline loaded out 3,200 yards of sand a day, working two 10-hour shifts. Size of the truck fleets varied, of course, with the haul cycle distance.

• Concrete—"Made in Florida" just about sums up the story on materials for the expressway structures. Especially concrete. Of almost 90 bridges (totalling just under 5 miles in length) in the causeway, viaducts and overpasses, only three are designed in structural steel. Prestressed concrete took all the rest.

Concrete makes good sense, too. All the ingredients practically "grow" here. Cement comes from the Everglades. Natural sand from mid-state. Stone is everywhere. And local plants batch the concrete as much and as fast as it's needed.

In fact, a big industry grew up around the booming demand for concrete beams. (A four-block-long section of the North-South expressway, for instance, alone called for 380 pre-

stressed members each weighing 22 tons.) Ready-mix outfits branched out into the prestressed field. At least one expressway contractor set up his own yard, and cashed in on a two-way payoff. Fewer job delays waiting for beam deliveries, plus a neat profit on operation of the prestressed yard.

What about costs? That's one of the brightest parts of the picture. Listen to William Dean, chief bridge designer for the state road department:

"When the big road program started, we took alternate bids—steel vs concrete design. After forty jobs came in with concrete low we adopted its use as standard. What's more, beam prices today are as low, or lower, than they were at that time, almost five years ago."

Bid figures bear out this claim. The going price for an AASHO Type II beam (for spans up to 60 feet) aver-

Draglines load out sand stockpiled in the center of Biscayne Bay. Dredges pump up almost 3½ million cubic yards of sand to be used as borrow on nearby sections of the expressway. Here two Northwest No. 6 draglines pull out some of the underwater material while waiting for haul trucks to arrive.

Box Score On Miami Expressways

ALMOST $50 million worth of road work within a 4-mi. circle centered on Miami's multi-level 36th Street interchange! No wonder insiders warn, you can't tell the contracts apart without a blueprint. This listing, keyed to the accompanying map, pinpoints the major projects and their status as of April 1, 1961.

Key No.	Contract Location	Contractor	Length, mile	Contract Cost	Percent Complete
1.	**Miami Beach spur**				
	Tuttle Causeway bridges	Powell Bros., Ft. Lauderdale, Fla.	0.7	$3,898,394	100
	East Approaches	Troup Bros., Miami, Fla.	0.7	3,387,011	100
	West approaches	Powell Bros.	1.6	3,949,383	100
	Biscayne Bay to 36 St. interchange	Wright Contracting Co., Columbus, Ga.	1.0	3,167,076	95
2.	**Interstate 95 freeway (North-South Expressway)**				
	36 St. interchange NE quadrant	F & C Industries & Geo. E. Bunnell, Ojus, Fla.	0.6	4,141,398	98
	36 St. interchange SW quadrant	A. F. Foster, Ojus, Fla.	0.5	3,749,000	40
	48 St. to 71 St.	R. H. Wright, Ft. Lauderdale, Fla.	1.4	2,023,568	98
	71 St. to 75 St. (viaduct)	L & A Contr. Co., Hattiesburg, Miss.	0.3	1,411,083	100
	75 St. to 95 St.	Allen Campbell Co., Tyler, Tex.	1.1	2,199,774	75
	95 St. to 119 St.	A. J. Capeletti, Hialeah, Fla.	1.5	1,973,859	15
	119 St. to 135 St.	Wright Contr. Co.	1.0	1,896,261	5
3.	**Crosstown tollway (36 St. Expressway)**				
	NW 12 Ave. to NW 22 Ave.	Capeletti Bros., Hialeah, Fla.	0.9	754,146	100
	NW 22 Ave. to NW 30 Ave.	R. H. Wright	0.9	1,053,484	100
	NW 30 Ave. to NW 37 Ave.	Capeletti Bros.	0.8	803,482	75
	NW 37 Ave. to LeJeune Rd.	Reed Const. Co. & Edwin G. Asche, Miami Beach, Fla.	1.1	3,143,115	50

Map of the Miami area pinpoints location of current expressway jobs. Routes keyed with the numbers 1 and 2 are part of interstate highway 95. Key No. 3 indicates the locally financed portion of the 36th Street expressway.

ages $13 a linear foot. The big Type IV beams (spans up to 100 feet) cost under $25 a linear foot. For that price the contractor furnishes and erects the beam.

What is above ground in the bridges is, like an iceberg, just a hint of what is hidden below. The structures stand on a forest of prestressed concrete piling, driven to depths up to 70 feet into the subsoil. The number of piles? Take the 36th Street interchange as an example. Its 34 bridges required 14-in. square and 18-in. square piling—six miles of the former and 13 miles of the latter!

• Steel—Plenty of it went into the structures, in the form of reinforcing rods for footings and piers, welded wire mesh for roadway slabs, and prestressing strands for piles and beams. The contracts for the two halves of the 36th Street interchange, for instance, called for almost 2,000 tons of re-bars in the poured-in-place parts of the structures; another 450 tons in the pavement.

The economic facts of life on this sharp-pencil work tipped the scales in favor of foreign steel. Many of the contractors ordered their re-bars and prestress strands from Italy, Germany and even Japan. Ships docked at nearby Port Everglades. There, cranes transferred the imported steel directly to over-the-road haulers for jobsite delivery.

So it added up to this—overseas steel cost less per ton delivered in the Miami area than steel obtained from U. S. sources. Most contractors can't turn down a bargain like this.

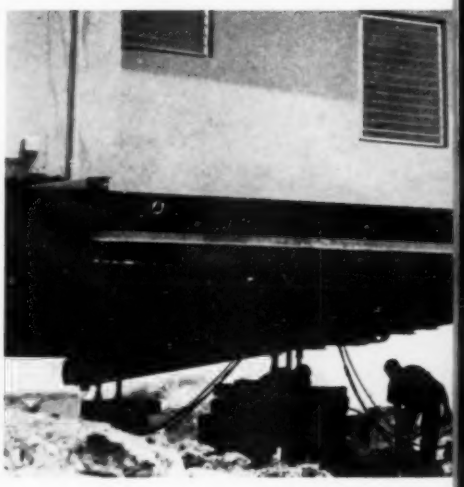
What is the catalyst that transforms expressway dreams to smooth strips of concrete and asphalt? Money, of course. Plenty of it has been committed here and plenty more will be needed before the last construction barrier comes down.

Issue Bonds

The sections of the system included in the interstate program (everything except the airport spur) are financed under the government's 90-10 formula. But the money needed to build a complete urban net far outstrips Florida's total allotment for years to come.

Rather than make-do with a stunted version of the complete plan, Miami's citizens decided to ante up the funds to get the job done fast. In 1959, a $25 million county bond issue, to be repaid from tolls collected, was sold to finance the 36th Street expressway spur from the stack to the airport.

Then the burghers threw a real curve. They needed $46 million more



Gangway, here comes a house! Motorcycle escort clears the way as the house-movers gently ease the awkward load around a tight corner. This masonry building weighs 100 tons, measures 32 x 70-ft. in plan.

to give the go-ahead signal now for work on the downtown leg of the interstate expressway. Sure, the money would be repaid from future allotments promised by Uncle Sam. But for now, the bonds would have to be backed by real estate taxes. And the bond issue would have to be voted by the people to be taxed.

Well, they did it, thanks to a masterful public relations effort. If your city is stumbling along with plans for good roads but no money—take note. The 1960 Miami bond issue proves beyond a doubt that tax-harassed citizens will vote to increase their burden. Just tell them why first. Just show them what they stand to gain.

The newspapers pitched in with articles and maps that detailed the long-range plans and painted a rosy picture of travel—with expressways. Radio and TV stations plugged the need for money to build *now*. Speakers rode the civic-club circuit to get out the "yes" vote.

Result? On May 3, 1960, Dade county freeholders okayed a 1¼-mill property tax to pay for $46 million worth of easy driving in the near future. The money will buy a lot of construction. Current estimates budget $25,500,000 for building the 4.6-mile downtown leg of the expressway. But land costs are the eye-opener. Right-of-way for this same stretch of highway is valued at $31 million!

The state tries to salvage some of its right-of-way money by putting on the market buildings that stand in the expressway's path. As a result, many Miami people are on the move—some with house and all. The final total of "displaced" families will come to 1,500. Imagine moving a town the size of Gettysburg, Pa. That will give you some idea of what contractors have on their hands in Miami.

The properties management division of the SRD runs the house-moving show. Their aim is to: (1) Clear the right-of-way for construction; and (2) Make some money doing it.

When there's plenty of time before bulldozers move in, the sequence runs like this. The state buys all property needed for an expressway section. That includes the land and the buildings on it; everything except personal property (like refrigerators, stoves, etc.). The count runs high in a crowded urban area like this. The two sections of the 36th Street interchange, for instance, displaced almost 500 buildings.

Bargain Homes

The SRD asks for bids on the houses, on an all-or-nothing basis. Just get them off the right-of-way, the contract demands. Two kinds of outfits took up the challenge. Real estate firms went into the house-moving business, and house-moving contractors went into the real estate game.

They grabbed the houses at bargain prices. A typical two-bedroom masonry home drew bids around $150. A good-sized mansion or duplex could command up to $500. But even at those prices the state came out ahead. There's profit on the houses sold. There's also a worthwhile saving over the old system, where contractors were actually PAID to clear the right-of-way.

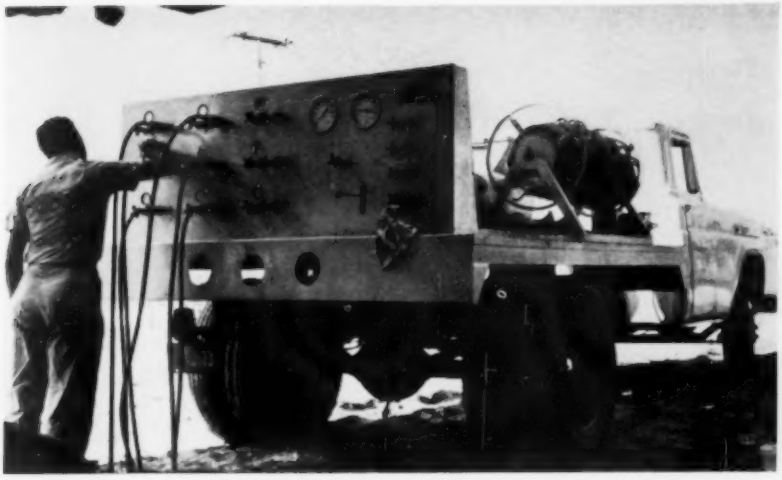
How about the outfits that bought these houses? They turned around and sold them to home-seekers for prices ranging from $3,000 to $10,000. Of course the price included some extras —like delivery to the customer's lot, putting in a new foundation and hooking up utilities.

Sounds like a get-rich-quick scheme, but there were some spiny thorns in the bed of roses. First, how to find buyers for the houses. Newspaper and radio advertising took care of that. Classified ads drew Sunday crowds that gave the deserted streets along the expressway route a gala open-house look.

Second problem: Find lots to put the houses on. With the big exodus under way, prices of nearby lots skyrocketed. The movers said, "All right, get a lot anywhere in the county and we'll move in the house for the same price." (Actually, once the house is on wheels it doesn't cost much more to move it one block or 20 miles.) One enterprising contractor carted 50 of his houses to a dock, loaded them on barges and floated them 200 miles to the hurricane-stricken Keys.

With costs adding up, contractors tightened their house-moving set-ups to save labor and time. The process runs so smoothly now, it rarely takes over two days to lift, move and re-set a house.

Watch this crew from Bruce Leon-



(Center) **Under a house to be moved, steel beams carry the floor load safely as the house rises to required 3½-ft. height.** *(Right)* **Control panel of Modern Hydraulic jacking unit tells the operator just how much load each jack carries. Levers let him raise all the jacks in unison, or control each jack individually.**

ard, Inc., tackle a big one—a 70x32-ft. concrete-block house weighing 100 tons. Shrubs and lawn plantings are already gone. (Local nurseries buy up valuable plants and trees.) With jackhammers, the men punch through the house footings, leaving a row of jagged holes all the way around.

Then small I-beams (called cross steel) are winched under the house at 2-ft. centers. This grid carries the floor load during the move. Now the men wriggle under the house and dig two long trenches at right angles to the cross steel. Into these go the running steel—deep beams that support the house on dollies.

The lift takes just a couple of hours with the central jacking system used here. The workers make a cribbing of heavy timbers under each of the eight jack points lined up under the running steel. Then they set up two hydraulic jacks (20-ton capacity each) at each of the lifting points.

Soon hose lines snake out from each jack to a plug-in control board at the rear of a truck parked nearby. This is the nerve center of the lift. Here the operator controls each jack, or raises them all in unison. He watches the gauges to check that each jack carries its share of the load. If one slips, he quickly locks all the others in place and twirls a single valve. Full oil pressure quickly brings the lagging jack back to normal.

The control board is just a "front" for the lifting operation. The business end of the hydraulics set-up lies on the bed of the truck. A 25-hp Wisconsin engine powers the main hydraulic pump. Also included in the self-contained package are a surge tank for hydraulic fluid, hose reels and racks for jack storage. A Ford truck carts the jack set-up from job-to-job at 35-mph speed.

The jacks lift the house in 16-in. steps. After each rise the men put more timbers in place to hold the load, then re-set the jacks for the next lift. When the house has been raised 3½ feet, the men trundle huge 16-wheel dollies into place—two under the rear of the house and one in front.

Then begins the touchy job of turning the house and pulling it out onto the street. Truck winches strain and tug gently to swing the lead dolly. Then they ease the house forward as the men put strips of pierced-plank landing mat under the dolly wheels to insure stable footing.

With the house in the street, a truck-tractor hooks onto the front dolly—and away we go. The route has already been reconnoitered and all low wires raised. But a police escort leads the way to ward off startled motorists and to halt traffic flow at corners. On the straightaway, the housemovers hit a 12-mph pace.

At the new site, the lifting process is reversed. The crew maneuvers the house over its custom-made foundation. Then the jacks gently lower it into place. Finally, the men winch out the grillage steel, plug up the footing holes, and turn over the house to it new owner.

Even the "dogs" (houses that couldn't be moved or couldn't be sold) were not a total loss. The wreckers stripped out and sold worthwhile parts like windows, doors, roof tiles, radiators—anything with salvage value.

Fate of unwanted houses is a fast trip to the rubble heap. Here a P&H crane clamshells debris into a dump truck.

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They Like Their Low-Cost Sewers

by Floyd Suter Bixby

Sanitary sewers for this small community? They're worth every cent they cost, say people who pay the bill.

Robertson's 14-B hoe moves steadily along a row of trees near Vancouver digging sewer in loose material. Machine fills the need for a middle-size trenching unit.

IT wasn't long ago that people in Hazel Dell, Wash., were at each other's throats over a small-community battle. Were sanitary sewers worth a $295,000 bond issue? Or weren't they?

Hesitantly, voters authorized the issue after much wrangling. Contractor James G. Robertson of Clackamas, Ore., has the first 30,000 feet under way. And now that dirt is flying, some of the earlier opponents of the issue are coming around to visit the work. When they do, they say "We made a mistake. Isn't there some way to extend this system to our block?"

In other words, Hazel Dell's people have proved to themselves that sanitary sewers are a good investment, even for a small community. Thanks to mechanization and the cost cutting which invariably go with it, Hazel Dell's inhabitants are enjoying a very low-cost design. Engineering, which was done by Zenier, Athay, Jackson & Hein of Portland, Ore., and Vancouver, Wash., deliberately sought a mechanized solution for trench excavation and other work which would hold costs down.

Resubmit Bids

When the first bids were opened, however, they were enough higher than available funds so that all bids had to be rejected. But the engineers then brought the next bids well within cost availability by designing new grades, made possible by today's backhoes. When grades were reduced in a few other places, the project became completely feasible.

By the end of 1960, the first 30,000 feet of line had been placed in service. It will connect to a pumping station and treatment lagoon, now under way through separate contracts. Phillip Jackson of the consulting-engineer firm pointed out that this actually represents only a small part of Hazel Dell's sewage system potential.

But important steps have been taken. A sanitation district has been formed, and that's always an important "first." The first project now being put in by Robertson will cover the commercial strip of Hazel Dell, including the main stretch of U.S. highway 99 which runs through the town, appurtenant businesses just north of Vancouver and a small adjacent area of homes. Mounting public acceptance of the work now under

Hydraulic hoe mounted on John Deere tractor prepares a trench site for heavier digging as it loads broken pavement.

way points toward an extension of the work as time goes by.

From the time Hazel Dell started—as a sprawling and disorganized strip of business and residential properties just north of Vancouver—the community had its share of growing pains. Restaurants, bowling alleys and service stations sprang up along the new highway after it was rebuilt to freeway standards two years ago. And more of the people who work in Vancouver and Portland began to build there—partly to escape high city taxes and partly to get farther away from the city.

Hazel Dell's underlying area is mostly sand and gravel. But there's also some hardpan. It's hard material, and contractors who bid pipeline jobs protect themselves against the contingency of having to drill and shoot. Raising the grades in the second design helped to eliminate this possibility, and much of the credit for resultant cost saving goes to that decision.

Rounding out the pipeline facilities of Robertson's is a pumping station. It's being built by Contractor George Lind. Contractor Paul Ferneding also has a treatment lagoon project under way. Perhaps a more proper name for this facility is an oxidation farm, where aerobic bacteria and algae are used together to digest sewage.

In addition to the $295,000 construction money raised by revenue bonds, the job will receive extra financing from a property assessment levied by Hazel Dell Sanitary District. Also, a nominal sewerage-use charge will help to boost revenues.

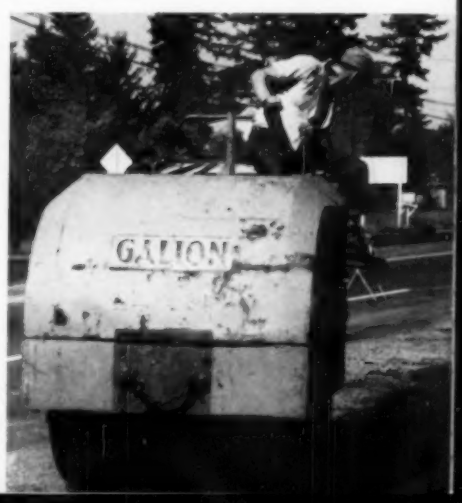
All the way, it's been a proving ground for machinery. There's been some hardpan, with plenty of easier digging in sand and silty soil. Despite this, some of the trench depths have been as great as 18 feet. That created a real test for the newer hoe equipment.

Middle-Size Hoe

Up to the time this project was bid, Robertson had been able to handle pipeline and sewer work adequately with three John Deere tractor-mounted hydraulic backhoes, and a pair of Bucyrus-Erie 22-B hoes. The smaller tractor-mounted units were used for small ditch work while the bigger 22-B's were used for heavy excavation in rock, mixed formations and deep trenches. Up to now, this seemed to be a winning combination—one which could handle just about any type of sewer or pipeline work the company cared to bid.

The Hazel Dell project pointed up the desirability of something in between—a machine which would combine part of the digging power of the

(Above) **Final step in paving replacement, sealing bituminous edges, insures rain-tight joint.** ***(Below)*** **Home-made paver works fine on narrow widths.**



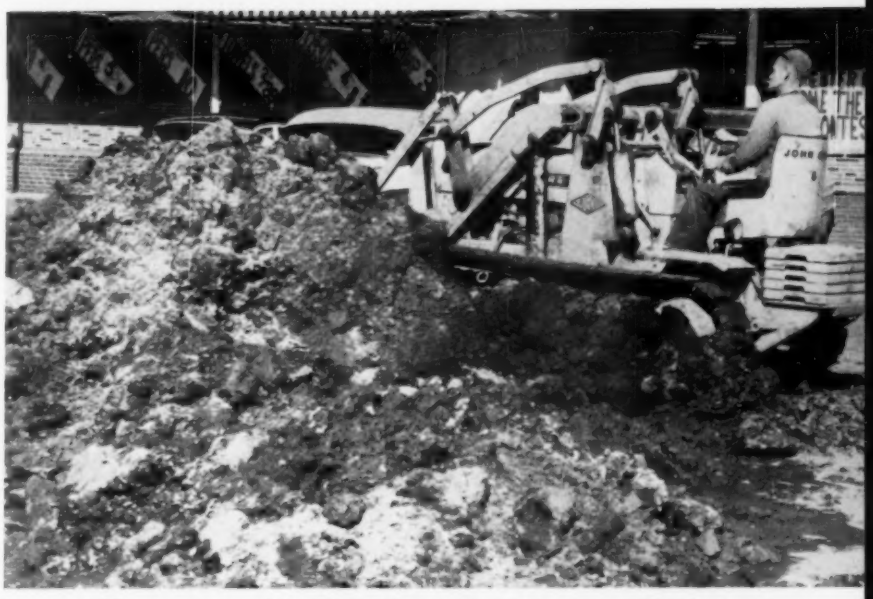
22-B with the mobility of the smaller tractor-mounted units. When Bucyrus-Erie introduced its model 14-B in the summer of 1960, Robertson was quick to see that the little rig would deliver a lot of performance for the investment it represented. He saw the machine in Portland at Clyde Equipment Co., and bought it outright.

Powered by a Continental engine, and carrying a ⅜-yd. dipper, this rig is being used for the excavation of about 50% of the trench. It's proved successful in sand, silty soils, and formations bordering on hardpan. It's dug trenches 14½ feet deep and reached occasionally to 15 feet. Highly maneuverable, the machine can be shifted on a moment's notice from one spot to another, can travel moderate distances under its own power to new locations, and because of its precise controls, has been fine for structure excavation.

Robertson's 22-B hoes also are on the job. They're being used for heavier work, for hardpan, and for deeper trenches where the 14-B can't reach down far enough. Proved on many jobs, these machines are justifying their purchase by turning in consistantly high production performances in heavy digging.

The John Deere tractor-mounted hoes are being used for shallow trenches, and on small-diameter pipelines. These machines have also been useful in digging out and locating intersecting utilities lines ahead of the bigger hoes.

The smaller machines also have been excellent project aids in excavating through bituminous pavement where trench lines are laid under city streets. Because pavement broken out in that manner must be replaced to Washington State Highway Department specifications, Robertson's operators take out the black top only to neat lines, load excess material to trucks if it isn't needed for backfill later on, and take special care with the backfill after the 6 to 15-in. pipe is placed.



Clay backfill is maneuvered by John Deere tractor with Ateco hydraulic dozer.

Close-Knit Job

All pipe being used is concrete or rubber ring joint asbestos cement with conventional bell and spigot joints. Suppliers in Portland and Vancouver deliver this material to the job, where they can be picked up and installed by machine. On small diameter pipe, the sections are rolled down or handed to the men who work in the trench. Because of the danger to children and automobile traffic if too much ditch is opened up ahead, Robertson's crews try to keep the job closed up within 500 feet from the point where trench excavation begins, to the point where final backfill is placed. Backfill is being replaced uncompacted in some places or compacted by flooding if it underlies street pavement.

Officials of the Hazel Dell Sanitation District, and representatives of the engineering firm are enthusiastic at Robertson's progress. Pavement restoration, which has kept up handily, is being done by Hudson Bay Paving Co. of Vancouver.

Robertson's organization has been a steadily growing one since it was started four years ago. At that time, Robertson bought a new 22-B backhoe and began specializing in water and drainage lines. The business expanded steadily, both in number of

(Continued on next page)

Largest of Robertson's hoes handles deep trenches and heavy excavation. This section of sewer trench in Hazel Dell, Wash., was deep enough to require side bracing.

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(Continued from page 21)

jobs and their size. Equipment has been added when necessary, beginning with a used 22-B backhoe and expanding later to the tractor-mounted hoes, and the new 14-B.

Like any prudent contractor, Robertson likes to own most of his equipment, renting only when it's necessary to take care of overflow production. Competition in the area has been so keen that profitable jobs haven't been easy to land.

The organization is still small, efficient, and has all workers and no chiefs. Jim Robertson wears several hats—that of general manager, general superintendent, chief estimator and bidder. His son, Richard, who can run any of the rigs, also takes over as a job manager, running one or more projects. Elliott Frahm is another key man, acting currently as superintendent on the Hazel Dell project.

Ken Eisort is the senior operator. He took delivery on the first 22-B in 1957 and has kept it working steadily and profitably ever since. Andy Griffith came with the second 22-B early in 1958 and is still with it. Glenn Mize, a former oiler swarmed into the 14-B when it arrived and refuses to get off the seat except for coffee. All machines have young efficient oilers who can more than hold their own.

Outside Servicing

On the theory that it's just about as economical to let distributor experts take care of repairs, Robertson has followed that course rather than to build up a shop. When the company grows to the point where its equipment investment will justify full-time mechanics, there's no doubt that they'll be hired. And, because the work centers largely around metropolitan Portland and Vancouver, it's been possible to hire local union help and run the jobs from Robertson's small headquarters located in Clackamas.

According to Jim Robertson, the middle-size machine has turned out to be an important tool on his pipeline work. The 14-B combines mobility with production, and will help the firm to grow in the years ahead. The 14-B will be moved to Newberg, Ore., shortly to handle the excavation for 3 miles of 18-in. water main.

Size of the two huge revolving shovels being built for Peabody Coal Co., St. Louis, Mo., is shown by these scale models of the 115-yd. machine itself, a $3\frac{1}{4}$-yd. 22-B shovel, and a pickup truck. When erected at Peabody mines in western Kentucky, the two mammoth shovels will be the world's largest self-propelled land machines.

Peabody Coal To Get Second Giant Shovel

SALE of a second model 3850-B excavator, the world's largest mobile land machine, to Peabody Coal Co., St. Louis, Mo., has been announced by Bucyrus-Erie Co., South Milwaukee, Wis. The gigantic machine is a 115-cu. yd. (dipper capacity) electrically-driven, revolving shovel.

The first 3850-B for the large St. Louis coal company was ordered a little over a year ago. This first machine will be erected at a new coal mine Peabody is opening in western Kentucky. Parts shipments will begin in September and will be completed next March. More than 250 railroad cars will be required to ship the machine's components.

The second earthmoving giant will also be erected in western Kentucky, where it will remove overburden from deeply buried bituminous coal seams. Initial parts shipments from South Milwaukee are to begin in 1962.

Besides several smaller units, Peabody already owns two large Bucyrus-Erie stripping shovels, each weighing about 5 million pounds. One, the *River Queen*, has a 55-yd. dipper and the other, the *Sunny Hill*, has a 65-yd. dipper. Both were built within the last five years.

20 Stories High

The mammoth new machines, however, will each weigh over 15 millon pounds—heavier than a Navy light cruiser. Each unit will stand 210 feet in the air—about 20 stories high. In 50 seconds, the 115-yd. dipper will pick up more than 170 tons of earth overburden, swing and dump it over 400 feet away and swing back for the next chunk of earth. Theoretically, the overburden removed by each machine in one month could fill all the cars in a train stretching from Pittsburgh, Pa., to Chicago.

The earthmovers require only a single operator, who will go to work via an elevator to his air-conditioned "penthouse" five stories up. He will control by two simple hand levers and two foot pedals—on each digging cycle—a third of a million pounds of overburden moving at a speed of 25 mph.

Peabody's purchase of the second model 3850-B is part of the coal firm's continuing modernization program. The giant stripping shovels are expected to lower the cost of mining deeply buried coal which otherwise would have to be recovered by underground mining methods.

Flexible Shovel Team Strips Variable Depth Overburden

Two shovels at the Panther mine of Green Coal Co. draw overburden stripping assignments that utilize their working ranges most efficiently.

Newly acquired 270-B shovel is assigned to digging shallower banks in the same pit as the bigger 1050-B. It has a specially designed front-end featuring a 100-ft. long boom and 8-yd. dipper.

ROLLING topography makes overburden stripping a variable proposition in the western Kentucky hill country where the Panther mine of Green Coal Co. is located.

Cover there ranges from 15 to 50 feet, and averages 30 feet. For that reason, the firm's management decided to purchase a new type stripping shovel to work in shallow overburden while its bigger 1050-B main shovel is assigned to areas where cover is heavy.

The new unit is a specially designed Bucyrus-Erie model 270-B electric excavator. It is the longest range stripper currently available on a two-crawler mounting. (An identical machine is in use at the nearby River Queen mine of Peabody Coal Co.)

The Green 270-B is equipped with a 100-ft. boom and an 8-yd. dipper on a 54-ft. long handle. The small dipper and long boom are designed to give the machine extra dumping reach so that overburden can be piled far from the highwall to provide a pit up to 75 feet wide.

The 270-B works in the same pit with the 42-yd. 1050-B, but at a considerable distance away at opposite end of the workings where overburden is easier.

The pit is fairly straight and is conducive to mining by large stripping shovel methods. It is four miles long. The 1050-B stripper maintains an 80-ft. width at its end of the pit, slightly wider than the 270-B.

The main haul road entry point is located between the two stripping machines. As a result, coal can be loaded from both ends of the pit simultaneously if desired.

Main stripping shovel at the Panther mine is this 42-yd. model 1050-B, which maintains a wide pit in deep overburden.

Shale Layers

Typical cross-section of overburden at the Panther mine shows a light cover of dirt, followed by heavy bluish-gray clay and layers of shale rock. Seam thickness of the Kentucky No. 9 is 4 feet, and it is classified as a steam coal. Underneath is fire clay.

The coal deposits follow the contour of the hilly terrain, and in some areas are up to three miles wide, but most of them are very deep—approximately 150 to 200 feet. The minable portions are outcrops which are normally from 15 to 50 feet deep.

From a modest beginning 13 years ago, Green Coal Co. has expanded rapidly. Approximately 3,500 tons of bituminous coal are now mined each day from the property located near Panther, Ky., about 15 miles southwest of Owensboro. Superintendent Royal Scott estimates that the property will provide enough digging for at least 15 years at the present mining rate.

The mine is one of the business enterprises of Robert E. Green. Green also operates the Green Construction Co., a well known Hoosier firm located in Oakton, Ind. The coal mine was started in 1948 as a wintertime occupation for the construction crews.

Pit work originally began there with two Northwest 95's plus scraper and tractor equipment.

Green Construction Co. does dirt excavation and drainage work. At the present time, there is practically no tie-in between the mining and the construction firm, except for the use of a

few scrapers for haul road building within the mine area.

Green, who is sole owner of both companies, lives in Vincennes, Ind.

In removing the broken overburden, the 1050-B works at a distance of about 25 feet from the highwall which allows haulers to swing past it and which also gives more dumping reach. It takes out about a 50 x 50-ft. block of material in a cut before moving up. It makes a full 180° swing to pile overburden high on the spoil pile, raising the dipper sheaves block-to-block with the boom-point sheaves to stack the material on top of the piles.

The 1050-B is designed with a 42-yd. dipper on a 113-ft. long boom. Its 70-ft. long dipper handle enables the machine to dump overburden as far as 225 feet away from its digging point. Maximum dumping reach from the outside edge of the crawler is 99 feet. Dumping height is 76 feet. Dumping radius is 121 feet and cutting radius is 131 feet.

Veterans in the western Kentucky coal field are Mine Superintendent Royal Scott *(left)* and Pit Foreman Fred Reeves.

Overburden runs abnormally deep (up to 80 feet) in a few hill areas and the 1050-B is taxed to its limit to gain spoiling room. In such places a pull-back machine is required on top the spoil pile. A Northwest 80-D dragline with 2½-yd. Hendrix bucket is available for this duty.

Generally speaking, a larger pull-back dragline would be teamed with a shovel of 1050-B size where there's a steady diet of overburden to handle this way. The excess burden is not great at the present time; so, a small machine can keep up with the pull-back yardage.

The 1050-B strips close to a million yards per month, according to estimates of Supt. Royal Scott. Scott also figured that the 270-B turns out about 180,000 yards a month when bank conditions are most favorable for efficient operation.

The 270-B has a maximum cutting height of 91 feet, a maximum dumping height of 75 feet and a maximum cutting radius of 100 feet. With this long range, the machine can easily carry a 75-ft. pit when the overburden is not excessive.

The 270-B can also be used to uncover pockets of coal where it would be uneconomical to use a 42-yd. shovel. Such a pocket might contain up to 100,000 tons of coal. The 8-yd. machine requires far less swing room than the big 1050-B, and consequently can round sharp curves and work in tight quarters.

Mounted on 34-ft. long treads which have pads six feet wide, the

Overburden is dumped on the spoil piles to the maximum dumping height of the 1050-B shovel. A Northwest 95 dragline equipped with 65-ft. boom and 2½-yd. Hendrix dragline bucket is used as a pull-back dragline when required.

Loading the 4-ft. thick Kentucky No. 9 coal seam is this Northwest 80-D, which carries a special 4-yd. Esco coal dipper. Haul truck here is a 50-ton Dart bottom-dump semi-trailer powered by a Cummins NRTO 335-hp diesel engine.

270-B is the newest addition to the Bucyrus-Erie line of quarry-and-mine excavators. The electric shovel is designed with front-end flexibility to accommodate dippers from 8 to 18 cubic yards.

With a standard quarry boom length of 47 feet, the 270-B can carry the 18-yd. dipper. That makes it the excavating industry's largest excavator mounted on two crawlers. The machine is equipped with a motor-generator set which converts AC power to DC for operation of functional motors. A new type of electrical system known as static control is used to govern operating functions.

Electric power comes into the mine at 68,000 volts and is stepped down to 4,160 volts in the pit, and 440 and 220 for operation of the preparation plant and other facilities. The electric stripping shovels operate at 4,160 volts.

Prior to digging by the stripping shovels, the shale overburden is drilled by a pair of McCarthy model 103 auger drills which bore snake holes into the bank a few feet above the seam. This type of drill, which is powered by a Ford Industrial gas engine, produces an 8⅝-in. diameter hole. Only horizontal holes are sunk; some of the holes penetrate up to 70 feet into the bank. When pictures were taken for this article, the auger was drilling 55 feet into the side of a 45-ft. high bank. Holes were spaced apart on approximate 15-ft. centers. Spacing between centers varies between 15 and 25 feet to accommodate changing depths of overburden and to assure proper distribution of the blasting agent. The lead auger section has an Austin head and AP8 finger bit. Sections 5 feet long are added as needed.

Spencer brand prilled ammonium nitrate pellets (Spec. N-IV) are delivered to the mine in 80-lb. bags. An on-the-site mixing procedure is used by powder crews to soak down the ammonium nitrate with fuel oil. This is done at the ratio of about one gallon per 100 pounds of pellets. A small mixing tank is mounted on the explosive truck itself. The admixture is poured into fiber bags through the funnel bottom of the tank.

Loading Procedure

Into each 50-ft. hole, go about eight bags of nitrate mix which give a loading of about 350 pounds. In the middle of the hole, a ½-in. stick of primer is inserted as a detonant. The primer is Austin Powder Company's brand Cordeau, which is a 45% dynamite. The primer is set off by electric caps. Atlas Rockmaster series 1 through 8 delays are used with three holes connected to a cap to set off 18 holes at each shot. Each hole is wired with 175-grain Primacord detonating fuse. Three leads are strung the entire length of the charge in the hole. One of the three strands extends from each drill hole to make a connecting link with the other holes and with the main fuse line.

A 7-in. thick concrete plug is placed at the end of the explosive charge to contain the blast, and finally behind the plug goes enough stemming to completely fill the hole.

According to Royal Scott, fragmentation has been very good to excellent. Generally, a pound of the explosive admixture takes care of from 7 to 10 yards of overburden.

No blasting is required for the coal seam itself. Instead, the powerful Cat D9 equipped with a Kelley ripper breaks up the consolidated formation for easier handling by the coal loading shovels. The 5-ft. long ripper blade, which is mounted on the rear of the dozer and operated by hydraulic down-pressure, plows deep furrows into the material.

Loading of the seam is done by a diesel-powered Northwest 80-D shovel carrying a special-size Esco 4-yd. coal dipper. A 25-ft. wide strip of coal next to the highwall is left intact as a road for haulage units and as a base for drilling equipment.

Off-highway hauling units working under the loading shovel are two Euclid 35-ton models and six 50-ton Darts. Haul roads at the mine

A pair of McCarthy model 103 horizontal auger drills bore 55-ft. deep snake holes into the side of a bank of shale. Powered by Ford Industrial gas engines, the drills produce 8⅝-in. diameter holes.

Caterpillar D9 bulldozer with a Kelley hydraulic ripper blade mounted at rear plows deep furrows into the seam to break the coal for easy loading.

(grades of which are kept under 10%) are maintained in excellent shape by the patrol units. Distance from the main pit to tipple is about 3½ miles.

Several miles from the main pit, a secondary pit, which is extremely winding and narrow, is being stripped by a diesel-powered 4½-yd. Lima model 2400 stripping shovel. A smaller-size shovel requiring little room for tail swing is needed in this pit, which averages about 40 feet. The coal loading shovel there is a 4-yd. Northwest model 80-D.

To handle road grading, clean-up and utility jobs, the mine has available two LeTourneau model D scrapers pulled by Caterpillar tractors; a Caterpillar No. 12 motor grader; and three D8's, one D7 and one D6. Three Ford F-100 pickup trucks are

Michigan 175-A front-end loader cleans up pit floor around stripping machines with its 2-yd. bucket. It also cleans off the coal seam prior to loading.

Panther mine's preparation plant was modernized in 1960 to upgrade quality of the product. It runs about 3,500 tons per day. Note smooth haul road.

(Left) **On-the-site mixing of ammonium nitrate prills with fuel oil is done on this rig.** *(Right)* **Bagged admixture of explosive is shoved into a snake hole. Note triple leads of fuse which extend all the way back into the blast hole.**

available for supervisor transportation. A Motorola short wave radio system allows communication between supervisors, operators of major equipment and the mine office. Sets are installed in the pickup trucks, mine office, scale house, preparation plant and the 1050-B stripping shovel.

Coal Broken

Coal from bottom-dump haulers is dumped at the tipple into a 550-ton bin which feeds into a Jeffrey 48 x 60-in. primary jaw crusher for reduction to minus 10-in. top size. A secondary crusher consisting of a 40 x 34 Jeffrey roll crusher further breaks it to 6-in. maximum size. The 6 x 0 size passes over an Allis-Chalmers vibrator that splits the raw feed into various fractions.

All production of the mine is hauled by over-the-highway trucks to nearby Owensboro, a distance of some 15 miles. The hauling is done by Vanover Brothers on a contract basis. The hired fleet is made up of 28 Fruehauf 17-ton lightweight semi-trailers pulled by International 220 and GMC 820 diesel tractors. Ten of the tractors are GMC and 18 are Internationals.

Drivers make the run to the Green Coal Co. dock located on the Ohio River at Owensboro. There the trucks discharge into a 60-ton hopper feeding a 48-in. conveyor belt that leads to barges. American Barge Lines, Inc., provides barges and tugboat service to deliver the coal to various destination points along the Ohio River.

A 170 x 80-ft. garage houses maintenance facilities at the Green mine. The welding, lubricating, greasing and general repair work necessary to keep the working equipment in good shape are done in the garage.

The payroll at the mine totals about 65 men. Stripping is handled three eight-hour shifts, seven days a week. Loading of coal is done during one shift, five days per week. One of the most striking features of the mine is the excellent shape in which equipment is kept. Stripping shovels are spotless from window panes down to the crawlers.

Besides Superintendent Royal Scott, other personnel at the mine include Fred Reeves, pit foreman; Dallas Hill, master mechanic; Bill Evans, chief electrician; and Rutherford Clark, tipple foreman. The 1050-B and 270-B shovel operators are Frank Weatherall, Lester Simmons, Lloyd Smith, Marion Haester, Ted Carithers, and Elmer Simmons.

An over-the-highway run of 15 miles is made from the mine to Green Coal Co. docks on the Ohio River at Owensboro. This 17-ton lightweight Fruehauf trailer is pulled by an International 220 diesel tractor.

Jackpile's 50,000-Hour Maintenance Bet

Equipment mechanics at Anaconda uranium mine in New Mexico prove that maintenance costs level off; plateau passes 23,000 hours in practice.

by Ray Day

ON a dusty road eight miles north of U. S. highway 66 at Laguna, N. M., a covered conveyor arches near the entrance road to Anaconda's Jackpile mine. Its belt has carried crushed uranium ore continuously for 4½ years. It's moved an estimated 5 million tons of abrasive, stone bruising rock into railroad cars which carry ore to Anaconda's Bluewater mill.

The belt wore out a year ago. But it wasn't replaced. Maintenance crews simply stepped up weekly inspections and preventive repairs. Result—a $30,000 replacement, bought "just in case," is still in the Jackpile warehouse, unused, but standing for emergency.

What's happened to this conveyor belt exemplifies good construction equipment preventive maintenance—some of the best in the western United States.

When equipment for Jackpile mine was purchased six years ago, Anaconda's management put an unorthodox thought into practice. The thought was this: with proper care, equipment can be made to last far longer than it usually does. Repair costs don't necessarily have to keep on rising. With proper care you can level them off on a reasonable plateau. Machines *can* be made to last, producing as well as they ever did, for a rather surprising number of years.

For example, 27 hauling trucks work at Jackpile. Of this number, 18 are on their fourth engine and have passed the 23,000-hour working mark. Eight are past the 20,000-hour mark, and one has exceeded 18,000 hours. These machines aren't being babied. They take regular and repeated shock loads from 5 and 6-yd. dippers on electric shovels. They climb steep grades; dissipate brake-drum heat on the return trip. They constantly carry real production loads.

But the astonishing thing isn't that the 23,000-hour mark has been reached. It's this—another mine is soon to open up nearby, after operations at Jackpile are completed. Anaconda plans to get productive, continuing use from these same machines through the *second* mine, for an estimated total of 50,000 hours!

This performance will be delivered under unbelievably tough conditions.

Busy scene at Jackpile mine shows shovel and hauling trucks hard at work on uranium ore removal. Haul road grades, dust and abrasion are all factors which take their toll on equipment.

Dust sucked into those truck engines contains up to 68% of silica before the air passes through the filters. Abrasive as any dust in the southwest, it ranks high in Jackpile's maintenance fight. It's an important fight. Every piece of Jackpile's equipment is tied to a fixed high-production schedule.

For a program that's delivered such real, measurable results, this one is amazingly simple. The shop isn't cluttered with mechanics, welders and stockroom clerks. Just enough men are on the payroll to get the maintenance job done well. There are no extras. The program isn't snarled in paperwork. Daily reports are short, simple. The master mechanic's work sheet is usually made on yellow ruled paper, and the items are checked off when they're finished, and then filed for reference. It makes a red-tape-free, but adequate record.

Heavy excavation and drilling are shown here as a P&H 6-yd. electric shovel loads Eucs in the foreground, while rotary drills work on the bench above them.

Simple Organization

There's no elaborate employee training program. Men learn by doing, but their "doing" is under constant scrutiny. This part of New Mexico had few really good mechanics when Jackpile opened. It's got some top-notchers now.

Nor is there an involved, complex chain of command. Mine Superintendent John P. Herndon assisted by Floyd Ballantine, heads Jackpile operations, under A. J. Fitch at Bluewater. Harry Alexander, assistant mechanical superintendent, and Ernest Riddle, maintenance foreman, head the preventive maintenance program. Divisions of responsibility below these levels are clearly defined, and are held to only a very few men.

Anaconda's preventive maintenance program protects an estimated

(Continued on next page)

ROLL YOUR OWN ...it's cheaper

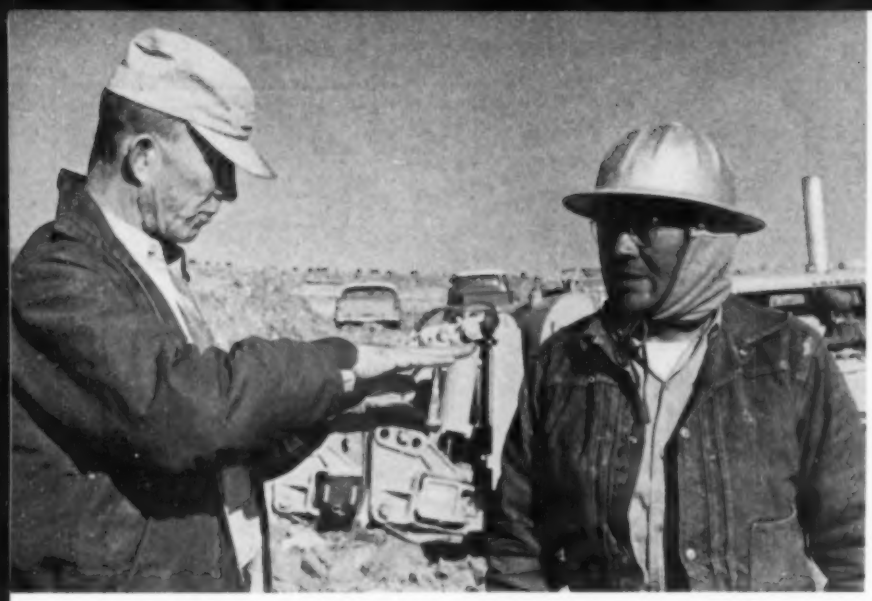
ROLL your own equipment repair is just as much a cost cutter in engine rebuilding as it is, applied to smoking.

John Herndon says he'll save about $1,000 each time his Anaconda mechanics rebuild one of the truck engines. For a few years, while mechanics were being developed at Jackpile, engines were sent in for rebuilding to Albuquerque jobbers. It wasn't really their fault that costs ran so much higher, Herndon explained. The jobbers had to guarantee the engines when they went back on the production line. It was inevitable that they'd replace some parts which didn't need replacing. And it ran the cost up.

Now, when an engine comes in for rebuilding, it's handled from start to finish at the Jackpile shop. Parts which show they'll probably last until the engine needs rebuilding again are left in. Genuine factory parts are used for the places which do need replacement.

To check on rebuild jobs, Riddle built a practical run-in stand, where a rebuilt engine can be operated for eight hours. During that time, mechanics check pressures and temperatures, and observe gaskets for any leakage. The stand has all necessary pressure and temperature gauges.

"Rolling their own" also has paid off on truck-hoist cylinders and pistons. Because the 68% silica content in dust was so abrasive, approved factory parts were wearing out in about 700 hours. Failures began to interfere with ore production. So Herndon's shop mechanics experimented with some new parts. Now, thanks to a new chrome-steel piston and a dust-proof packing gland which prevents hoist oil contamination, they're getting 2,500 hours before hoists need to be overhauled.



On a cold winter morning, Mine Manager John Herndon shows an Indian catskinner how to strip some high-grade ore.

$4 million mine equipment investment. It covers seven shovel units, ranging from a 6-yd. electric model to a ¾-yd. rig used chiefly for clean-up work. The 27-unit fleet of hauling trucks represents a big part of the maintenance job. So do auxiliary units like tractors, drilling equipment, rippers, motor graders and compressors.

Time is money, so the saying goes, and it's true here. If downtime can be reduced, it means more uranium ore handled; lower unit costs. By keeping the productive capacity of a machine up, Jackpile's officials reap the obvious initial benefit of uptime, rather than downtime. Secondarily, such maintenance also tends to firm up the expenditure for parts and service, so that maintenance costs can more accurately be predicted.

Many modern advancements have been adopted to shave these costs. They include a basic policy of rebuilding everything, including engines, at the mine shop with mine mechanics. It's definitely lowered the cost of rebuild jobs by giving mechanics an opportunity to be more selective in replacing parts. Another important part of the program is an extensive changeover to dry type air cleaners. This gives engines longer lasting dust protection, and cuts the number of mechanic man hours. There's an excellent hardfacing program, where it's required. Inspections are complete, but they're also simple and regular.

The changeover to dry air filters is far enough along so that Herndon now can safely predict it will save two man shifts per day. In the process, of course, engines protected by these improved cleaners are lasting an average of 100% longer on the production line, between overhauls, as compared to the previous system.

It used to be that grease monkeys would service the filter element at the crusher once each day; maybe oftener. It was especially true during the summer, when dust was bad. Improved filtration has brought a form of automation to preventive maintenance. The engine now operates for two weeks at a time, even under bad conditions, without a mechanic ever touching a filter element.

The current changeover will put modern air cleaning equipment on all stationary diesel engines, all crawler units including Cats, all Euclid trucks, and two crawler-type drills.

To make the changeovers, Farr Roto-Pamic kits are being used in sizes recommended for the various engines. The kits make neat, non-protruding installations, Herndon says. The filter is a two-stage cleaning element. Cyclonic air movement in the first stage drops the heavier large-micron dirt into a collection chamber, where an engine-exhaust-driven aspirator tube sucks it out automatically. About 80% of the dirt is removed automatically, in this manner.

Only very fine-micron size dirt gets into the second-stage paper element. When air passes through this element and into the engine cylinders, it's clean. Mixed with high-grade, filtered fuel, it's helping the engines to deliver more productive hours on the line than ever before.

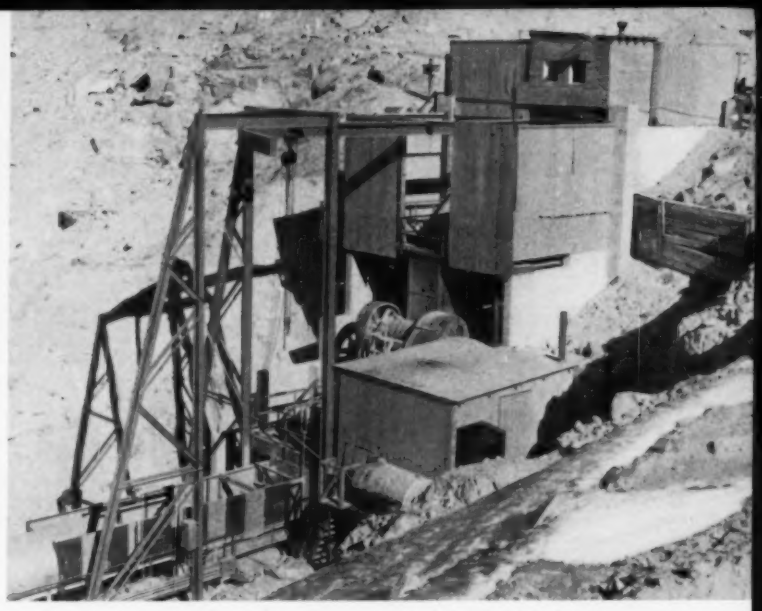
Herndon said that about 50% of the units planned for the filter changeover have now been equipped with dry-type filters. The remaining units are being changed over as regular overhaul schedules bring them into the shop for other major work.

The installations include an automatic indicator, which shows at a glance if a filter is plugged with dirt. Mechanics now check an installation simply by glancing at the indicator. If it doesn't show red, no service is necessary, and no time is wasted removing a cover for inspection.

Saves Labor

Herndon has good reason to expect real results from the changeover. It's almost a certainty that two man-shifts will be saved each day. It will more than justify the move, he explained.

There's an old saw which says, "hunt hard enough for trouble, and you'll find it." Jackpile's maintenance men do exactly that. The big pit is under constant observation, 24 hours a day, by a patrolling mechanic. There's a two-way radio in this man's pickup to speed communications. He carries heavy-duty tools, parts which need frequent replacement, and emergency supplies to make spot repairs.



(Left) **The belt on this covered conveyor has handled over 5 million tons of material, and it even stayed in service a year after it was worn out, thanks to good maintenance.** ***(Right)*** **The same 5 million tons passed through this Pioneer jaw crusher setup, but maintenance has kept the plant in like-new condition.**

Even when his radio isn't summoning him to some part of the pit, this mechanic still prowls in his search for trouble. There are many ways to spot incipient breakdowns.

A diesel exhaust beginning to belch black smoke, for example, means that fuel injection is faulty; combustion inefficient. Too much slack in a set of Cat tracks can mean that an adjustment is due, or that a general inspection of rails and idlers is necessary. Pieces of spilled ore on a haul road is a signal for close inspection of tires. It also means a call for the motor grader operator. Cuts and bruises must be repaired promptly if tires are to last their full service life.

The entire program organization is planned to spot trouble, too. Lubrication and maintenance on trucks is scheduled for once a shift. That also goes for all pneumatic equipment. All crawlers are serviced at least once every 24 hours by two Alemite-equipped lube trucks. Their crews travel over the pit and visit the various units at regular intervals. Fuel also is delivered to the pit.

Once every 200 hours, each truck is brought to the shop for a thorough lubrication and checkup. Other maintenance intervals occur at 5,000 hours which is rebuild time. When a truck comes into the shop after 5,000 hours of operation, a standby engine, completely rebuilt, is ready. If the machine needs transmission replacement,

(Continued on next page)

Gadget With a Purpose

PICTURED here is one of Jackpile's most useful pieces of equipment. It's the first multiple scintillometer-scanner ever built for a western United States uranium mine. It'll do a job almost impossible previously. Here's how it works:

A truck, loaded with uranium ore, rolls to a stop under the scanner. Multiple scintillometer heads —mounted above, to the sides and and below—measure uranium content by scanning the load. Findings are translated from a calibrated chart. Each load can be sampled in about 30 seconds. The trucks are then routed to stockpile areas, where loads are dumped without further waiting.

No Manual Labor

The $30,000 machine has eliminated wasted truck time, and thereby boosted haulage production. Expensive hand sampling, necessary a few years ago, is no more. Bluewater mill gets a more uniform ore product.

Perhaps that's why the unit is called "the handiest gadget around here."

Not all of Jackpile's equipment is old. This new power-shift Cat D9 dozer is being used for ripping, and overburden stripping. Maintenance, nevertheless, is very important.

a new torque converter, or something of that nature, it's ready and waiting to go in. Even on a 5,000-hour overhaul, a truck isn't usually out of service more than a few days to a week.

"We plan our week's work like a preacher," laughed Maintenance Foreman Ernest Riddle. "The sky pilot spends all week thinking about his sermon. It's his Sunday punch. We do the same thing, in a way. Sunday's our big day, even though the equipment is idle."

Building up toward this big day are a week's supply of daily operator reports. These carry some repair suggestions best handled on a long repair day. On the power shovels, especially, many jobs show up which take time. They can best be handled when a full maintenance day can be devoted.

Sunday Punch

Alexander's men plan their big day like a general plans his battle attack. For Sunday is the zero hour, the end of planning and the start of attack. Parts, ordered and delivered during the week for the occasion, are in the shop and ready to go. When Sunday morning comes, the mechanics are ready for their big day, too.

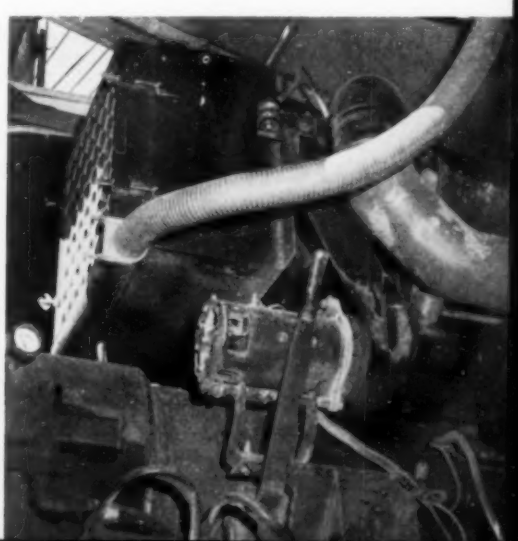
This also is a good day for preventive hardfacing. Much hardfacing is handled also during the week, too, but the 10-hour time interval on Sunday is excellent for welding on crushers, dozer blades and power-shovel buckets. Dipper-tooth rebuilding is usually a weekday job.

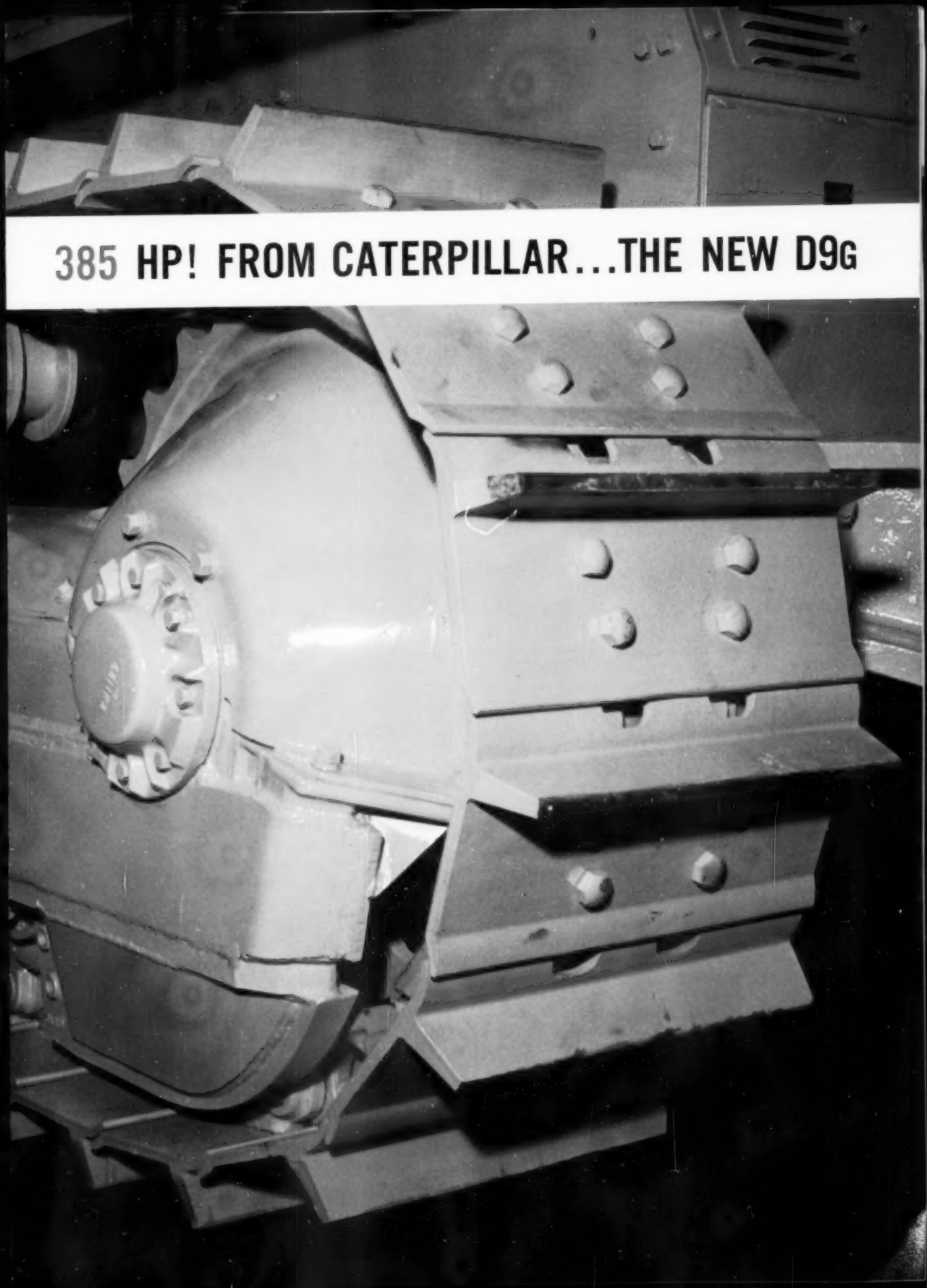
Maintenance of the belt conveyor and other large machinery is also handled best on Sunday. The regular weekly stepped-up preventive maintenance program on this long day is directly credited by Herndon for adding a full year's life to the delivery conveyor.

Success of Jackpile's program now is evident. With each successive year of service life, about 5,000 more hours will be worked by each machine. This will continue long after operations have shifted from Jackpile to the new pit. Project officials now have every reason to believe the program they've started will keep the machines working for 50,000 hours before they're through.

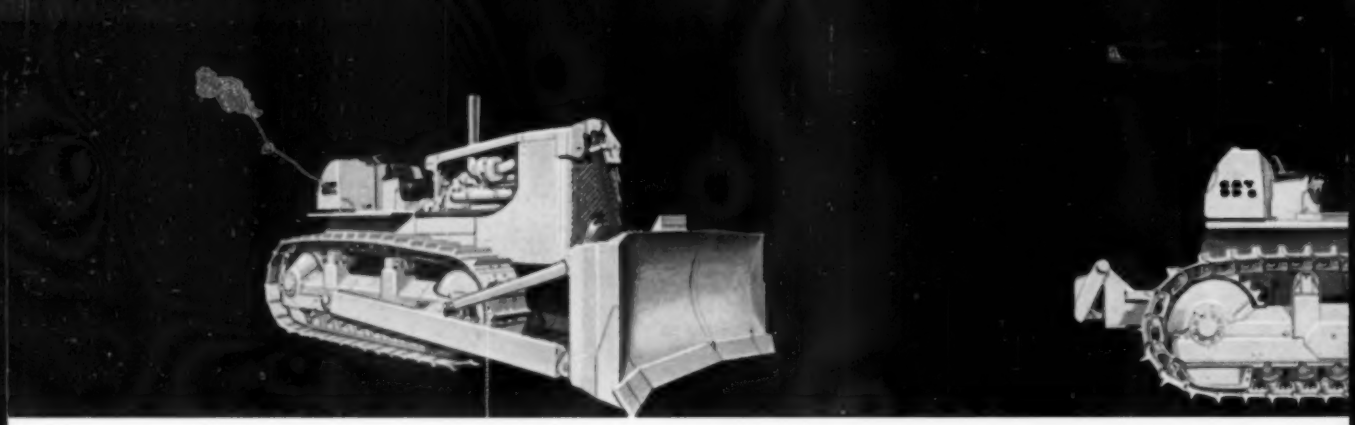
Field operations at Jackpile are under the general supervision of A. J. Fitch, whose responsibility also includes supervision of the Bluewater mill. Working under Fitch at Jackpile are John Herndon, mine superintendent; Floyd Ballantine, his assistant; Harry Alexander, assistant mechanical superintendent; Ernest Riddle, maintenance foreman; Ralph Ater, power shovel foreman; Pete Paquin, engine maintenance supervisor; J. D. King, mine maintenance shift foreman (he's over all pit mechanics, too); Chick Graham, mine maintenance shift foreman; and Jim Dorsey, lube foreman over all shifts.

(Left) **Tough, brutal uranium ore digging creates both dust and abrasion problems. Abrasion is combatted by hardfacing beads on the dipper teeth; the dust is handled by modern dry-type air cleaner.** ***(Right)*** **Closeup of 56-tube air cleaner on the GM engine of this 3-yd. shovel shows the self-cleaning aspirating tube which leads from the bottom of the unit to the exhaust stack.**





385 HP! FROM CATERPILLAR...THE NEW D9G



NEW D9G: 385 HP, 64,800 LB., POWER SHIFT,

For high-volume dozing, pushloading or ripping, the new D9G has what it takes . . . at minimum cost per yard!

The engine in the new D9 delivers 385 flywheel horsepower. That's *100 more horsepower* than the first D9 introduced five years ago!

Weight: 64,800 lb.—14% more than the first D9!

Torque divider power shift transmission . . . massive heavy-duty undercarriage . . . and power train with new, built-in ruggedness for long life.

What else is new? Matching the D9G, to make best use of its power, is a full line of attachments. Cable controls, hydraulic controls, pushing equipment, dozers, rippers and others—all designed to help this new tractor really put out on the toughest big jobs.

CAT D353 ENGINE AND MATCHED POWER TRAIN

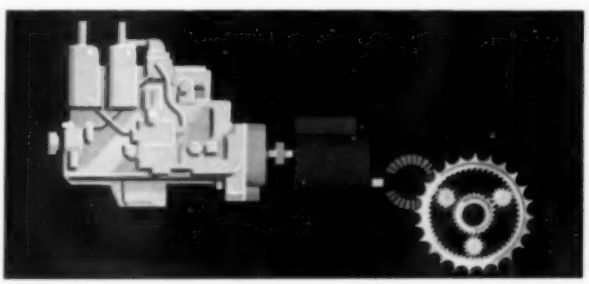
Engine: This engine, rated at 385 HP (flywheel) at 1330 RPM, has been proven over thousands of hours on the roughest jobs. Cat-built, its 6.25″ x 8″ 6-cylinder design now incorporates these new features:

• **Controlled Turbocharging**—This system, found only in the D9G among crawler tractors, automatically forces more air into the cylinders during lug. Result: increased maximum torque, fast engine response over a wide range of operation.

• **Aftercooler**—Air leaving the turbocharger passes through a water-cooled heat exchanger. Cooled air has greater density. Thus, more air can be packed into the cylinders, giving greater power output and efficiency.

• **PLUS**—Shroud-mounted fan with torque limiting clutch provides maximum cooling during lug and reduces fan-absorbed HP by 30%. Exclusive Caterpillar fuel injection system allows use of low-cost fuel. Also, twin dry-type air cleaners . . . oil-jet-cooled pistons . . . "Hi-Electro" hardened cylinder liners and crankshaft journals.

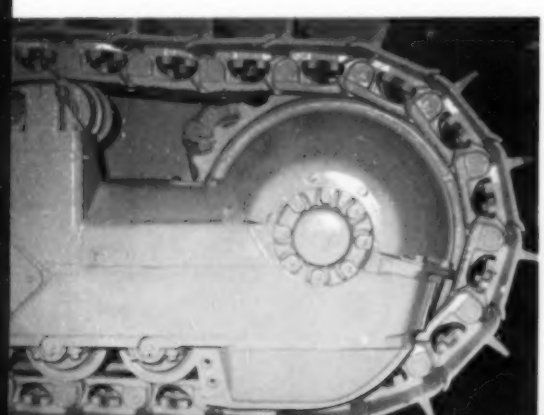
New Power Train: Major advances in the D9G's new power train include *new oil-cooled steering clutches and brakes, new planetary final drives*, and a time and cost saving *common lube system*.

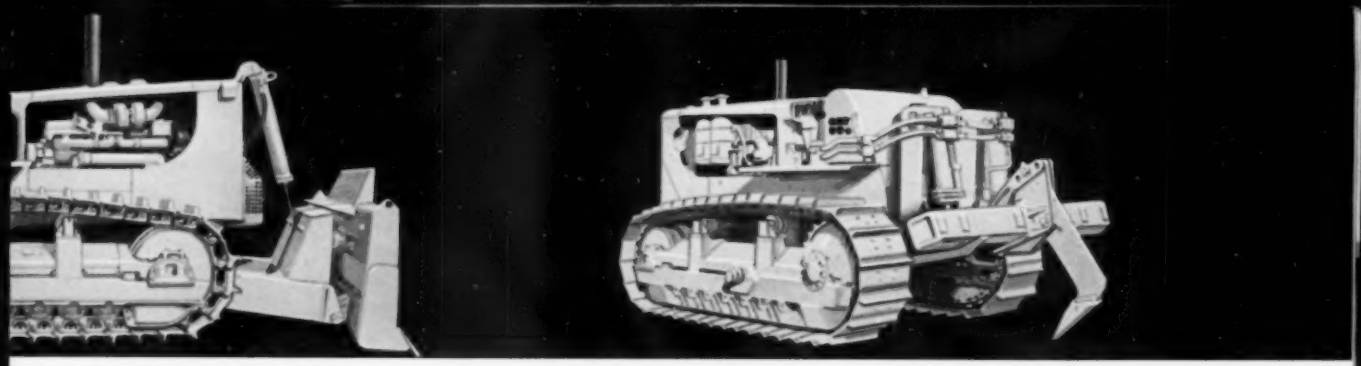


The new steering clutches, spring engaged and hydraulically released, need no adjustments. The longer service life of this type of clutch, as well as that of oil-cooled brakes, has been proven by millions of hours' use on D8H Tractors.

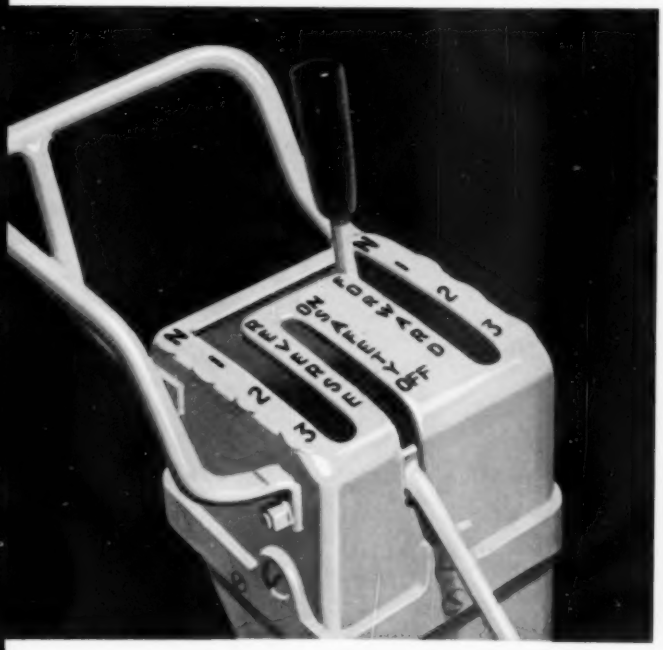
The new planetary final drives increase gear reduction ratios from 8.8:1 to 18:1, materially reducing torque load on all other power train components. A common system cools and lubricates torque divider, transmission, bevel gear, steering clutches and brakes. This means one service point . . . one type of oil. Final drives have their own pressure lube systems complete with pump, filter and disposable element.

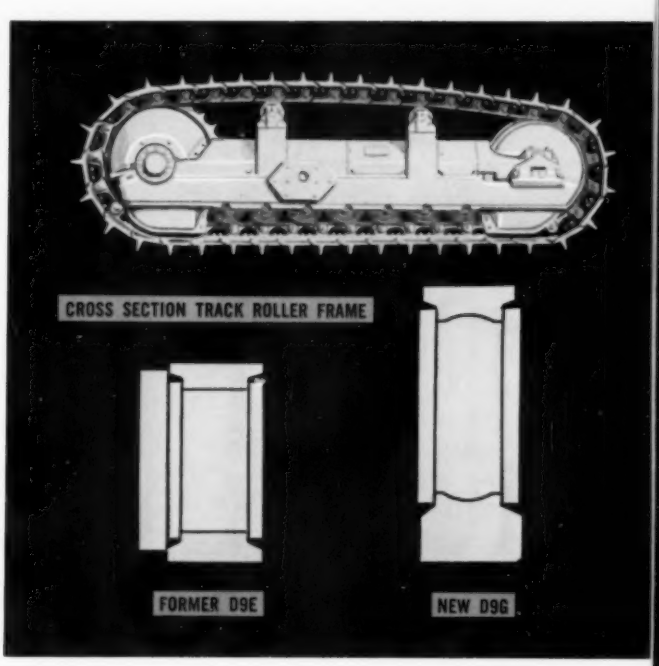
Entire power train has unitized construction for fast, individual removal of components.





HIGH-PRODUCTION DOZER, PUSHER, RIPPER





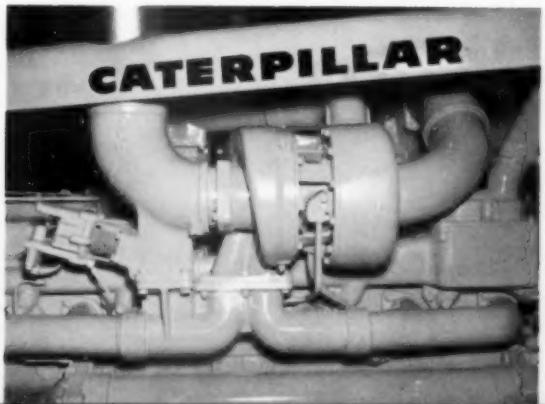
PROVEN TORQUE DIVIDER POWER SHIFT:

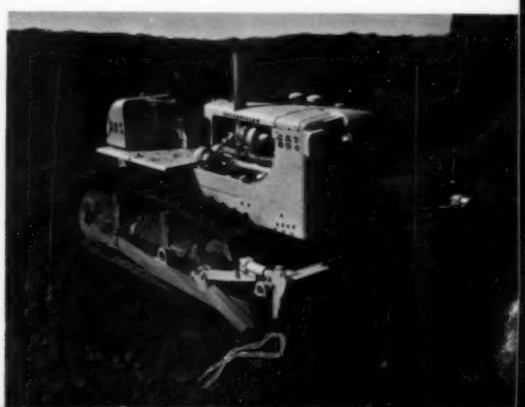
Standard equipment on the D9G, this exclusive Caterpillar design combines the efficiency and "snap" of direct drive with the load-matching and anti-stall characteristics of a torque converter.

A single lever gives the operator finger-tip control of his machine. It adds up to fast cycle times, less operator fatigue with greater efficiency. You get more out of the machine *all day*.

MASSIVE HEAVY-DUTY UNDERCARRIAGE:

Immense strength and rigidity have been built into the D9G undercarriage to make it more than equal to the roughest ripping job. Box section frame is wider and deeper than previous models. Hydraulic track adjusters are standard. Lifetime lubricated rollers with special alloy deep hardened rims assure long life . . . and they require no servicing until rebuilt. These features give the D9G the finest big tractor undercarriage ever built.

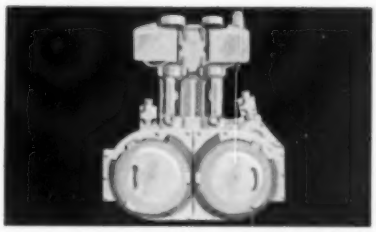




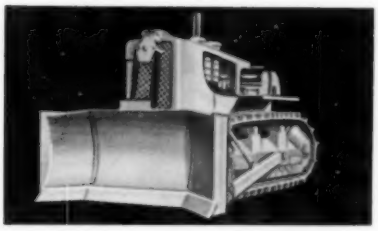
The NEW 385 HP D9G—with high-production attachments

The D9G is big . . . and, it becomes versatile, too, with the many matching attachments your Caterpillar Dealer offers. Cable controls, hydraulic controls, rippers, dozers, pushing equipment, scrapers and others help make the D9G the most productive big tractor available.

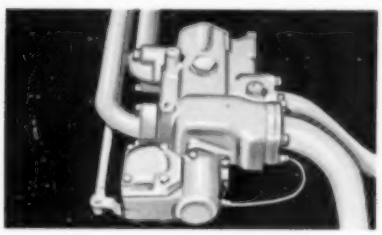
To prove the D9G's productive capabilities on your job, talk to your Caterpillar Dealer.



New cable controls have larger clutch, brake and drum capacities and are hydraulically boosted. Available in front or rear single drum for dozer application. Rear single drum may be converted to double drum at any time. You buy what you need.

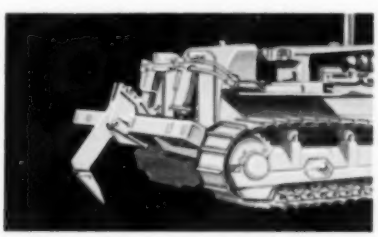


No. 9U can increase dozing production as much as 50%. Also available are No. 9A and No. 9S. Tilt cylinder can be used with U or straight blade. Choice of hydraulic or cable control for all blades. Hydraulic dozers have "quick-drop" valves.



New hydraulic controls available in nine arrangements to meet every application need.

No. 9C dozer combines dozing and cushioned pushing functions into one attachment. As a pusher, it allows 3 MPH cushioned contact. Rear-mounted cushion push block also available for tandem pushing.



No. 9 ripper – 5-position clevis, selection of shanks and tips, quick-change features adapt No. 9 to a variety of materials and conditions . . . results in considerable savings over drilling and blasting.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

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BIGGEST NEWS in wire rope in years!

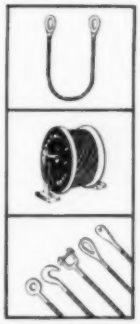
You owe it to your company to learn about Macwhyte's new 7-FLEX.® But—be prepared to change your thinking about wire rope!

You've never seen another wire rope like 7-FLEX — there is no other like it! It's an *all-purpose* wire rope, flexible as 8-strand — rugged as 6 x 19 — fatigue-resistant like a 6 x 37.

There is 16⅔% more wearing surface in 7-FLEX than there is in a 6-strand rope. There is less unit pressure between rope and sheaves, so less rope and sheave wear. There is more sheave contact, less rope-creep. Result: longer rope life, less downtime, lower operating costs!

7-FLEX can make important savings on many wire-rope applications. Ask any Macwhyte distributor. Free Bulletin 60100-R available upon request.

Other Macwhyte products that serve you profitably



Slings — Safe, easy-to-handle Macwhyte slings for every lifting need are available in round-braided, flat-braided, or Safe-Guard styles. Many standard designs. Also custom-made to your requirements. Send for Bulletins 5308-R and 5886.

Corrosion-Resisting Wire Rope — Many sizes and constructions in Stainless Steel, Monel Metal and plastic or nylon coated. Meet the requirements imposed by alkaline and acid conditions and marine atmospheres, temperatures, and humidity. Send for Bulletin 49-30.

Wire Rope Assemblies — Safe-Lock wire rope assemblies are precision made to your order in the size, length, and strength needed. Uniform high quality with fittings permanently swaged to the rope. Many standard designs. Send for Catalog 6101.

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Wire Rope Manufacturing Specialists Since 1896

246

(Left) Cat D9 tractor with Kelley ripper rips every foot of trench on 227-mile, 8-in. Calnev pipeline. *(Above)* A 22-B hoe with ¾-yd. dipper scoops sand and caliche out of ditch. One of four hoes working with the ditch gang, the 22-B excavates 2,000 to 3,000 yards per day.

Pipe Spread Lays Five Miles Daily in Mojave Desert

Military fuel supply line is laid on a hurry-up basis by Tulsa pipelining firm. Timing of operations is all-important to maintaining speed.

"YOU'VE got to wheel and deal when you're laying four to five miles of pipe a day," said M. O. (Tommy) Thompson, spread superintendent for Williams Brothers Co.

He was referring to the 227-mile Calnev products pipeline extending from Colton, Calif. across the Mojave desert to the Nellis Air Force Base near Las Vegas, Nev. The 8-in. diameter line roughly parallels U. S. Highway 91-466.

When completed, the pipeline will be used to transmit jet and diesel fuel to Nellis as well as to George AFB north of San Bernardino. The design, construction and management of the line are being handled on a contract basis by the Tulsa (Okla.) pipeline contractor.

Using an all-Caterpillar spread, Thomson's hustling crew of about 200 men are averaging almost 4½ miles per 10-hour day, and have hit production peaks of better than five miles a day.

Begun in early February, pipelaying was scheduled for completion last month. The small pipe, of course, is easier to lay than the big inch, but what pipeline is without problems? Thompson pointed out, for example, that because of the speed with which

Cleveland 320 ditcher, one of two on the job, opens 3-ft. wide ditch along the right-of-way in less rocky areas. Road and railroad crossings, 75 in all, were bored in advance of the ditcher.

the pipe can be laid, the entire spread must move at a fast clip. This means keeping downtime to a minimum and maintaining a constant flow of supplies so that no single section encounters unnecessary delays. Stringing trucks, fuel and lube trucks, skid trucks and similar support equipment are kept constantly on the move.

Flat Terrain

The terrain itself is relatively flat, except for a 10-mile stretch where the line is scheduled to cross the foothills of the Ivanpah mountains. But the Mojave is deceptive. Under innocent layers of sand lies rock and caliche. "You can't take a chance on it," said Clayton Paddie, assistant superintendent, with a shake of his head. "You have to rip every foot of the ditch." To do this, Thompson is using a Cat D9 tractor with a 6-ft. Kelley ripper, which shatters the material at the rate of 15,000 to 20,000 feet a day. In addition the big machine assists two D8's dozing aside rocks and boulders along the 50-ft. wide right-of-way.

Then there's the road and railroad crossings—75 in all. In this project the boring crew precedes the ditch gang, so that the approaching ditcher can tie in accurately with the boring angle. Opening the boring site is a ½-yd. Insley K backhoe. Borings for a 12-in. casing are made by a Crose-Perrault boring machine cradled by a Cat MD8 pipelayer.

Straddling the ripped seam of the trench are two Cleveland 320 ditchers each powered by a Cat D339 engine. They are cutting the ditch two feet wide and three feet deep. For obstructions, depth is increased to seven

Spread Supt. M. O. (Tommy) Thompson *(left)*, and Clayton Paddie, assistant superintendent, keep things running smoothly for Williams Brothers.

Cat MD8 pipelayer supports both the pipe and a shop-made cleaning and priming machine by means of a combination yoke and sliding ring arrangement. The steel rail is suspended by four rollers, which keep the cradle and primer in balance.

feet. Meanwhile, plucking out boulders and scooping out chunks of caliche are two ¾-yd. Bucyrus-Erie 22-B's with Cat D318 engines and a ½-yd. Insley K backhoe powered by a D311.

When solid rock is encountered, a Gardner-Denver drill mounted on an MD6 pipelayer goes to work. The MD6 is also used to pull an Ingersoll-Rand 600-cfm compressor. Rock shot with 40% Hercules ammonium nitrate is clawed out of the ditch by a ¾-yd. Insley L.

String Pipe

Along the open ditch another MD7 is used to unload the lengths of pipe from five Ford F-800 stringer trucks, each carrying 47 joints of pipe. Capable of withstanding 2,000 pounds of hydrostatic pressure, the pipe has a .250-in. wall thickness for mainline use, and .270 for crossings. A Cat D6 and a D7 tractor are used to tow the trucks up grades or over rough terrain. Haul distances are limited to about 40 miles with railheads located at Las Vegas and Jean, Nev., and Barstow, Victorville and San Bernardino, Calif.

Because the ditch follows natural grade, the Crose-Cinch pipe bending machine is being used on nearly every joint for side and overbends. The pipe is handled by an MD7 during the bending operation.

Like most of the other sections, the pipe gang and firing line are averag-

(Left) Spot ditching is handled by a ¾-yd. Insley hoe. *(Right)* Cradled by an MD8, a Crose-Perrault coating and wrapping machine applies a 3/16-in. layer of Riley enamel and wraps the pipe in fiberglass and asbestos felt.

ing about 23,000 feet per day. At this rate the welders don't linger long over each joint. For example, the two welders on stringer beads are completing joints in 40 seconds or less. Two MD7's are used during lineup and clamping. On the firing line, three welders work on the hot pass and six on finish weld. Power is obtained from two 300-amp and one 200-amp Lincoln welders mounted on each of two D7's, and six wheel-mounted 200-amp welders pulled by Fordson tractors.

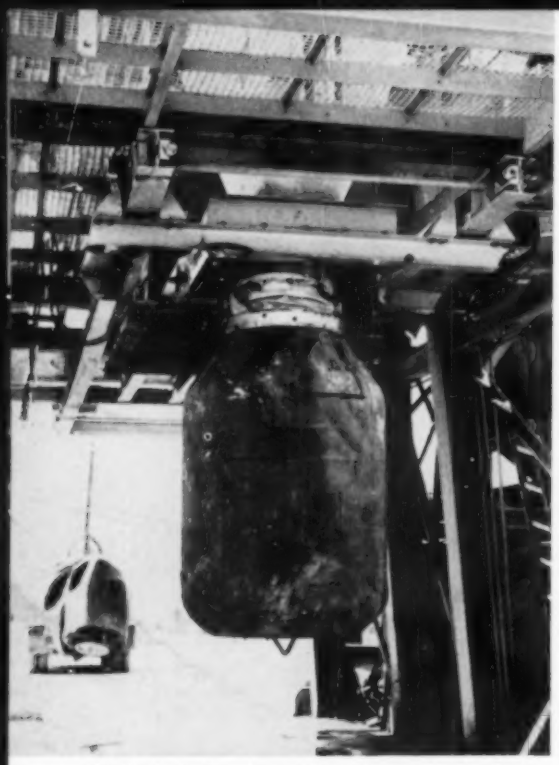
The swampers are hustling, too. Using a shop-made cleaning and priming machine, they are topping out at 25,000 feet per day. A MD8 pipelayer supports both the pipe and the cleaner-primer by means of a combination yoke and sliding ring arrangement, which keeps the two in balance. The pipe cradle and cleaner-primer are held in position at each end of a steel rail approximately seven feet long. The rail is suspended on each side by a pair of rollers in a housing, which is connected to the pipelayer hook. The wheels can either roll freely along the rail to strike proper balance or they can be locked into any fixed position by a steel pin inserted in holes on 3-in. centers.

The Crose-Perrault coating and wrapping machine, also supported by an MD8, applies a $^3/_{16}$-in. layer of Riley coal tar enamel and wraps the pipe in fiberglass and asbestos felt. An MD7 acts as catch-off. Both lowering-in and tie-in are handled by two MD7's, with welding power provided by a truck-mounted 200-amp Lincoln welder. Spot ditching is handled by a Cleveland J-20 ditcher and a ¾-yd. Insley L clam. Backfilling the ditch is a Cleveland 190, followed by a D7 with angle dozer and No. 12 motor grader on clean-up. The latter averages four passes per mile, five miles per day.

Averaging four passes per mile and covering up to five miles a day, a No. 12 motor grader blades right-of-way on cleanup operation. A D7 tractor with angle blade is also used on cleanup.

In addition to the equipment already mentioned, the spread includes 35 trucks and six buses. Foremen assisting Thompson are Charles Graves, right-of-way; Charles Warren, stringing; Loren Payne, crossing; Norbert Burgess, ditching; John Shanklin, pipe; Howard Cook, welding; Red Wilson, dope gang; Red Singleton, lowering-in; Kermit Davis, cleanup; and George Antonic, master mechanic. A. T. Maxwell is chief inspector.

(Left) **With tie-in almost completed at a road crossing, two MD7's prepare to lower the pipe into the ditch.** ***(Right)*** **Closing the ditch is a Cleveland 190 backfiller.**



Method of charging rubber bag at the batch plant looks like this. Plant automatically proportions the concrete ingredients and fills the container.

Prepackaged Concrete Cuts Batching Costs

Revolutionary new concept of concrete delivery levels out the usual peaks and valleys of production at the plant. Basic idea is comparable to the way a cake mix is prepackaged for housewives.

Rodeffer Industries rigged up this rolling truck mixer with a hoist, so that packaged, bagged concrete can be put into the mixer drum in a hurry.

VISUALIZE this concrete pour of the future:

• Concrete will be ordered many days ahead, delivered at the convenience of the batch-plant people, and dumped on the job in stockpiles in rubber transport bags.

• On the day of the pour, the general superintendent will have absolute control of materials and labor.

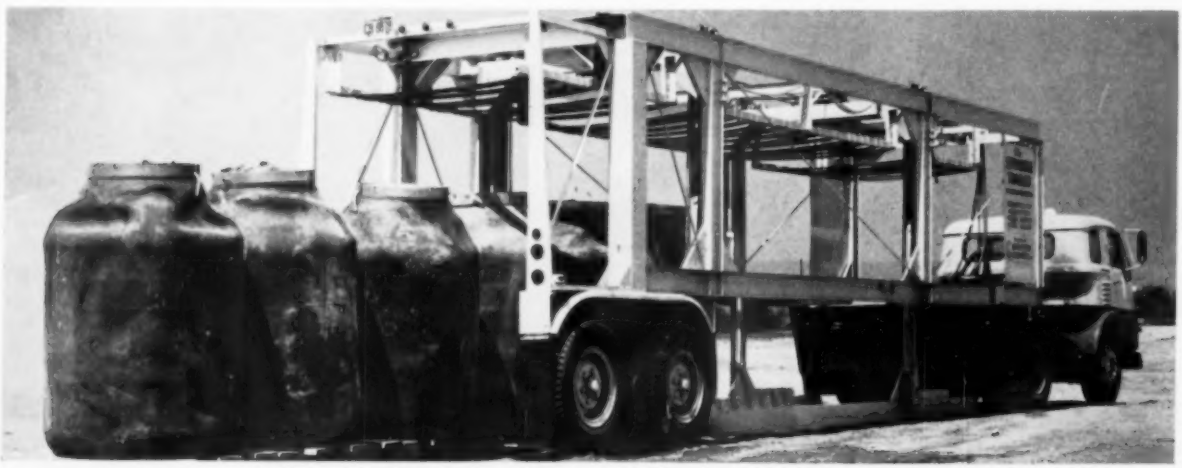
• There won't be any question of slump, strength, or water-cement ratio. Water, cement and aggregates—and perhaps admixtures—will all be in the bag to assure design precision hitherto reserved for the laboratory.

• Batching costs will have been reduced from today's 50 cents per cubic yard to between 10 and 15 cents.

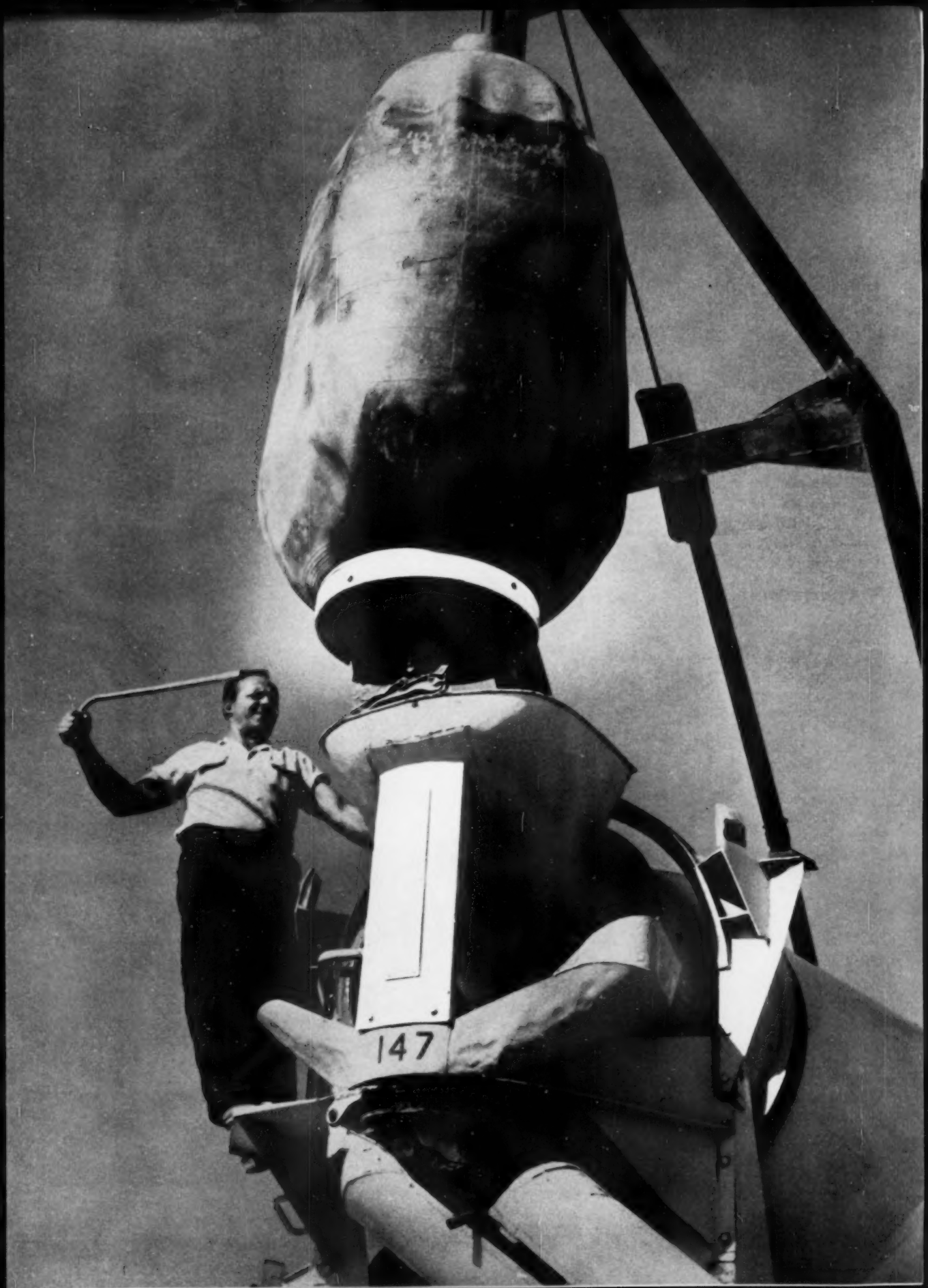
• There will be a tremendous saving in batch-plant investment for the concrete supplier, because one central "package" factory at the aggregate or quarry production site will handle the same large-area concrete requirements which now take multiple plants and dozens of men.

That condensed picture is now close to reality, thanks to E. O. Rodeffer of Rodeffer Industries, Inc., of Pasadena, Calif., one of the area's largest

(Continued on page 46)



Newest method of transporting the bagged mix is this Challenge-Cook Straddle Trailer. It was designed originally as a hauler for Coca-Cola cases, and it handles palletized loads quickly.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Cement goes in the small inside container, which is waterproofed from the aggregates and water. Bag has tight seals to hold water where it belongs.

Concrete . . .

(Continued from page 44)

producers of aggregates and ready-mixed concrete. Rodeffer, who was deeply concerned about the usual peaks and valleys in production in his business, decided to iron it out with a revolutionary new concept of concrete delivery. Big problem: how to package the material in about the same way a cake mix is pre-packaged for housewives. Paper wouldn't work. Something a lot stronger was needed.

Rubber Firm Helps

Rodeffer took his problem to General Tire & Rubber Co., of Akron, Ohio. The first container bags have now been developed, proof tested through 1,397 uses under tough conditions, and a few experimental jobs poured. At first Rodeffer visualized a rubber bag strong enough to hold the ingredients for a 1½-cu. yd. batch of concrete, including all aggregates, sand, water and cement in a separate watertight compartment. Because so many dump trucks are still owned by contractors and materials suppliers, he pictured this method of transportation.

That's been changed now, since Challenge-Cook of Los Angeles brought out the Straddle Trailer. Built originally for hauling empty and full Coca Cola bottle crates, the unit is ideal for hauling pallet-loaded concrete bags and setting them down gently.

"Obviously a number of contractors will elect to use what dump trucks they now own until they wear out," Rodeffer explained. "So the bag must be made strong enough to stand up economically under very rough handling. But there's equally no question that many contractors will want to buy the Straddle Trailer. So will ready-mix companies which go into that method of batching. It will make the bags last immeasurably longer."

At the present time, bags of 1½-cu. yd. capacity have been standardized upon. The bag weighs about 250 pounds empty, is six feet long, and has a lifting ring on the bottom end so it can be hoisted and dumped into a truck mixer by conventional construction cranes. The bag's exterior wall is made of six-ply rubber, ⅜-in. thick, while the bag inside is of $\frac{3}{16}$-in. smooth rubber. Concentric loading necks, 21½ and 7½ inches in diameter, are made of a vinyl material, and extend about three feet beyond a steel collar at the container's loading end. Material is fed through these vinyl necks to the pod's individual compartments.

Until now, the bags have been filled for the first jobs at one of the company's batch plants in the San Gabriel Valley. Because of trial and error, it started as a somewhat laborious undertaking, but has now smoothed out to a one-bag-per minute procedure. Batching outfits, such as the Noble Co., of Oakland, Calif., are working on batch plant adaptations which, automated, will fill one of the pods in about 10 seconds. It may also be that the job mixer of the future might take the form of a truck-mounted turbine mixer with its own hoisting equipment. At present, Rodeffer has three conventional truck mixers rigged up with winch-equipped hoists for that work.

Idea Licensed

According to Rodeffer, his patented idea will be available to all commercial batching oufits and contractors as rapidly as the manufacturer can produce the units. A transmission-line job in a remote area of New Mexico and Arizona is being estimated around this method. Other experimental remote-area jobs have been done in places like San Clemente Island, for the U. S. Navy.

If things go as Rodeffer plans, concrete suppliers of the future will be able to make aggregate gradations on a ¼-in. bin split, bid concrete around design guarantees, have no early-morning or all-day-Friday peaks any longer, and have much less plant investment. And for the first time in his life, the job superintendent will have control between labor on his job and his other important factor—materials.

Early proof testing put just as much punishment on the bags as men could devise. Because many contractors and materials suppliers have dump trucks, it's likely that some of the handling will be done like this.

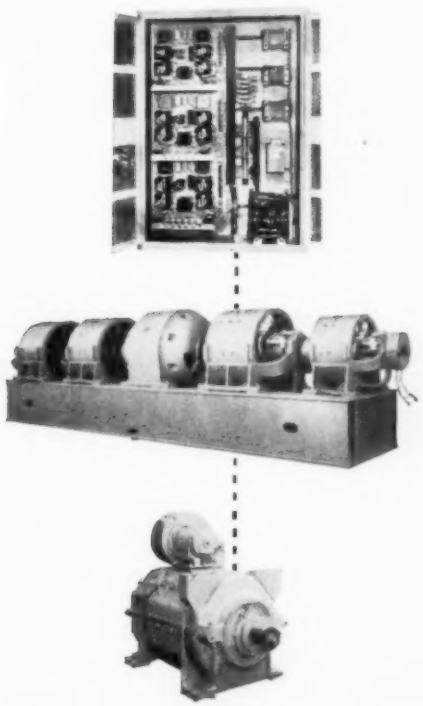
New General Electric
SCR Static Control
Now in Operation

SETTING NEW DIGGING STANDARDS

General Electric in conjunction with Bucyrus Erie announces a significant advance in shovel performance—a BIG loading machine with superior dynamic response to all digging requirements.

To meet demanding digging conditions of Taconite ore, Bucyrus Erie engineers and General Electric jointly developed and applied to B-E's new 270-B machine, the first *Silicon-Controlled rectifier, full power, full reversing, control system* ever applied to a Bucyrus Erie machine.

Featuring no moving parts and almost instant response, the new SCR control system was "design proven" on a computer before manufacture. Next came extensive equipment tests at General Electric's Erie, Pennsylvania, plant. The complete shovel then underwent actual field testing in the pit, to assure *full customer satisfaction*. The 270-B is now in actual production digging. System-engineered with G.E.'s rugged direct current MD shovel motors and reliable d-c motor-generator sets, the new SCR system minimizes the effect of current overshoot under such dynamic conditions as boulder shock, for maximum protection and minimum maintenance of the entire shovel system. Designed for low maintenance and backed by nationwide service facilities, the new shovel drive system offers minimum downtime and maximum performance under the most severe digging conditions.



For complete information contact your nearest General Electric Industrial Sales Office or write General Electric Co., Section 827-07, Schenectady 5, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

NOT IN THE CONTRACT

The customer was a would-be comedian. "How much are your twenty dollar shoes?" he demanded of the salesman.

Replied the salesman, who was on his toes, "Ten dollars a foot."

Mary, age six, invited a playmate to spend the night with her. Of course they awakened the next morning before her parents did, so they got out of bed and tiptoed into her parents' bedroom. Her little guest went over to the vanity dresser to look at all the interesting things and saw a picture of a man in a beautiful frame. It was Mary's father taken during his college days.

"Who's that?" asked the guest.

"That's my Daddy," replied Mary.

The guest looked at Mary's father asleep in bed and then asked, "Then who is that in bed with your Mommy?"

"Laura could have married anybody she pleased."

"Then why is she still single?"

"She never pleased anybody."

A farmer was explaining to a city woman what a menace insects are to farm products—how corn borers destroy corn and potato bugs ruin potato crops.

The city cutie listened attentively, then exclaimed:

"And the poor dairy people. How the butterflies must bother them."

The person who always watches the clock will very likely remain one of the hands.

John: "My wife has the worst habit of staying up until one and two o'clock in the morning, and I can't break her of it."

Joe: "What is she doing all that time?"

John: "Waiting for me to come home."

The little old lady was stopping at an old-fashioned hotel in a small town. Ever apprehensive about fire, she no sooner checked into her room than she left to locate the fire escape. By accident she opened the door to the men's bathroom, to face a gentleman reclining in the bathtub.

"Oh, pardon me," she said, "I was just looking for the fire escape."

She had no sooner gone a few steps further down the hall, when the bathroom door burst open and the soaking wet bather clad only in a hastily clutched towel ran after her shouting, "Where's the fire!"

A man pinned beneath his car following an accident was being questioned by a policeman.

"Married?"

"Nope," said the man, "this is the worst fix I was ever in."

"What shall I say about the two peroxide blondes who made such a fuss at the baseball game last night?" inquired the news reporter.

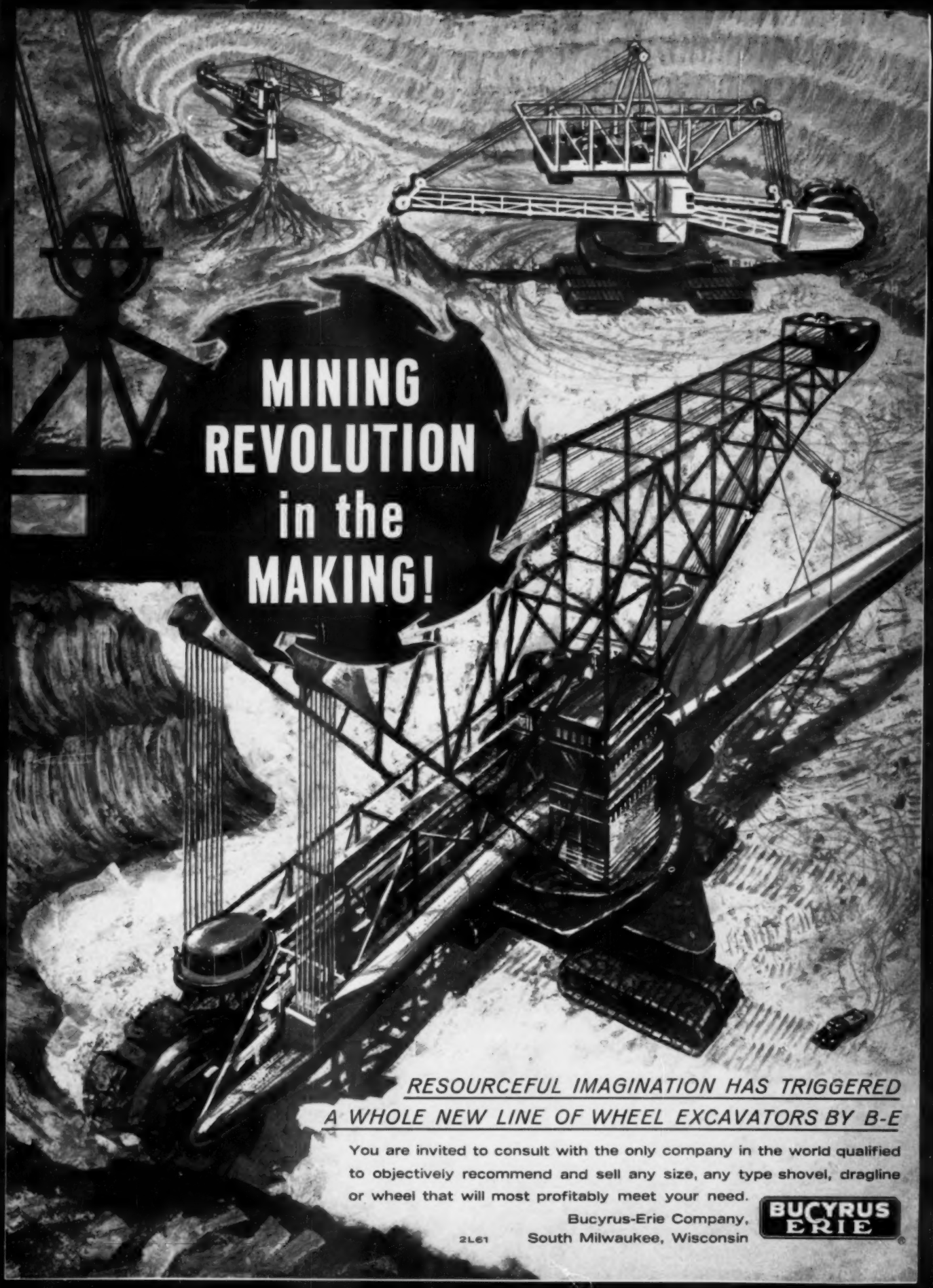
Editor: "Why, just say that the 'bleachers' went wild."

Two lions escaped from the zoo in Washington, D. C., and didn't meet again for three months. One was fat, the other nothing but skin and bones. When they finally met, the skinny one said, "I've never seen you looking better. How in the world do you manage to be so well fed?"

The fat lion replied: "I've been hiding in the Pentagon eating a colonel a day. So far, nobody's noticed it."

Engineers are continually surprised to find that girls with the most streamlined shapes offer the most resistance.

"Rest them for a while, Miss Stilld—my eyes are getting tired."



RESOURCEFUL IMAGINATION HAS TRIGGERED
A WHOLE NEW LINE OF WHEEL EXCAVATORS BY B-E

You are invited to consult with the only company in the world qualified to objectively recommend and sell any size, any type shovel, dragline or wheel that will most profitably meet your need.

Bucyrus-Erie Company,
South Milwaukee, Wisconsin

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BUCYRUS ERIE

NEWS FROM THE FIELD

Glen Canyon Concrete Passes 20% Mark

The millionth cubic yard of concrete was placed last month in Glen Canyon Dam, principal storage feature of the Bureau of Reclamation's Colorado River storage project.

When completed in 1964, the concrete-arch dam will have a total volume of 4,865,000 cubic yards and a height of 710 feet, making it the second highest dam in the western hemisphere.

Glen Canyon Dam is on the Colorado River, 13 river miles downstream from the Arizona-Utah state line. Construction of the dam and the 900,000-kilowatt powerplant at the toe of the dam began in May 1957 under a $107,955,522 contract awarded to the Merritt-Chapman & Scott Corp., of New York City.

Early construction activity at the damsite included excavation of two diversion tunnels, construction of cofferdams and diversion of the river, and keyway and foundation excavation and shaping. Construction was halted for six months by a labor dispute which began in July 1959. Work resumed early in January 1960.

Placement of the first bucket of concrete in the dam was made on June 17, 1960. Concrete placement since that time has been at an average rate of about 40,000 cubic yards per week.

Water impounded behind Glen Canyon Dam will form a reservoir, named Lake Powell, which will have a storage capacity of 28,040,000 acre-feet. This will be the largest storage facility in the Upper Colorado River Basin.

Freyensee, Brooks Named to Sales Posts at Bucyrus-Erie

In two recent sales appointments at Bucyrus-Erie Co., South Milwaukee, Wis., Howard Freyensee was named general products sales manager and Robert P. Brooks succeeded him as large machine sales manager.

Freyensee, in his newly created position, reports to Lewis C. Black, vice president—sales. Brooks and the

R. P. Brooks

H. Freyensee

company's other product sales managers report to Freyensee.

A 1942 graduate of DePauw University, Greencastle, Ind., Freyensee joined the firm in 1945 as a special apprentice. He was attached to the firm's Atlanta and Chicago sales offices, and later was appointed large machine sales manager.

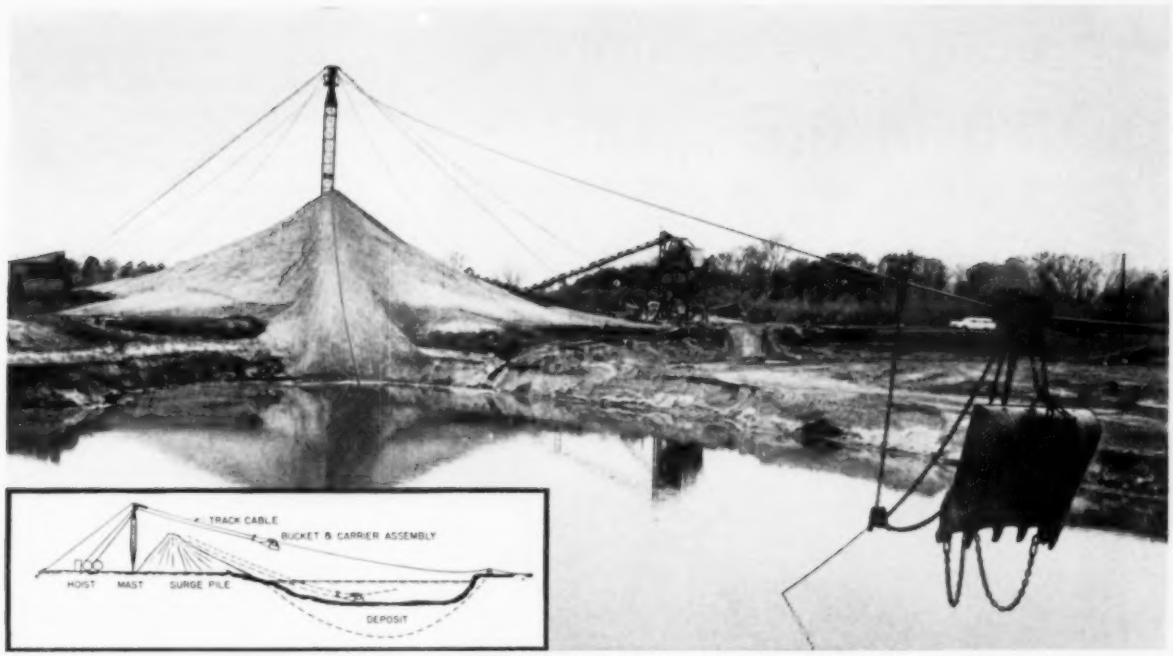
Brooks is a 15-year veteran with Bucyrus-Erie. He was a sales representative attached to the company's Seattle sales office, and was northwest district sales manager prior to transferring to South Milwaukee as assistant sales manager for large machines and blast hole drills four years ago. He subsequently served as sales manager—quarry and mining excavators and manager of mining machine sales. Brooks is a 1942 graduate of Penn State University.

Immerman Is Chosen President of Moles

Harry T. Immerman, vice president and chief engineer of Spencer, White & Prentis, Inc., has been elected president of The Moles, an association of heavy-construction engineers and executives with headquarters in New York City.

Other officers elected were: Eugene

(Continued on page 52)



Dig, Haul And Stockpile For 6 Cents Per Ton...

If you are planning a new plant or modernizing an old one, consider the economies of digging and hauling your raw material with a Slackline Cableway. Direct operating costs run about 6 cents per ton for operator's wages, power and maintenance when working average deposits and hauling to a surge pile.

The Slackline Cableway's handling capacity is governed by haul distance and digging depth. This allows fast, short hauls when maximum tonnage is needed to meet demands. Conversely, when time permits, the reach of the Slackline can be stretched to the extreme limits of the deposit to rebuild or create a reserve pile. The use of a surge pile in conjunction with a Slackline enables operations to continue when plant processing is halted due to weather or stoppage. This reserve of material also makes it unnecessary for the Slackline to continuously match plant tonnage requirements.

A Slackline can begin operation at ground level and dig to depths which cannot be reached with other equipment. It digs 125 ft. below water and hauls up to 1000 ft. This deep digging assures maximum clean-up of your deposit. The additional material obtainable with a Slackline can keep your plant running longer without expensive relocations of equipment.

Call or write for more information on the low operating costs and long service life of a Slackline Cableway. Request Catalog C for general information.

Average Cost For Operator's Wages, Power and Maintenance Using a Sauerman Slackline

Slackline Bucket dumps automatically over surge pile. Material is dug from a deep deposit on an 800 ft. operating span.

SAUERMAN BROS., INC.

622 So. 28th Avenue, Bellwood, Illinois
Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent DragScrapers • Slackline and Tautline Cableways • Durolite Blocks

Precautions Safeguard Trenching Operations

Safety first on this job—walls of trench are properly shored to prevent cave-in, and barricades protect the public

by Herbert R. Westlund
Argonaut Insurance Co.

Large trenching jobs are almost always planned with measures to eliminate or control hazards.

Comparatively small trenching jobs, which comprise the majority of such operations, are seldom planned for safety. As a consequence, deaths and injuries on small jobs are quite numerous. They result from neglect of common safety precautions.

Simple Checklist

Observance of the following safe practices will prevent many injuries in routine trenching operations:

1. Open only as much ground as needed for good operating results, and backfill as soon as possible.
2. Properly shore or slope all trenches in excess of four feet deep unless in completely stable soil. Otherwise use a trench box.
3. Keep spoil at a distance of 18 inches or more from the edge.
4. Keep all unnecessary traffic as far from excavation area as possible.
5. If gas of any type is suspected, make periodic tests with gas detection equipment. Provide for removal or control of the hazard if gas is present.
6. Provide ladders for trench entrance and exit.
7. Erect and maintain warning signs, lights and barricades to protect the public.
8. Instruct employees in safe work methods, and require use of personal protective equipment as indicated by the nature of the work.

Reprinted from Construction Safety Hints Bulletin No. 15
National Safety Council, Chicago, Ill.

News . . .

(Continued from page 50)

G. Rau of J. Rich Steers, Inc., first vice president; Howard G. Dixon of Johnson, Drake & Piper, Inc., second vice president; Joseph B. Diamond, treasurer; Eugene F. Moran, Jr., of Moran Towing Corp., secretary; and Herbert Giles of Harold Dessau, Inc., sergeant-at-arms.

Four men were elected to three-year trusteeships: Robert Crimmins of Thomas Crimmins Contracting Co.; George F. Flay Jr. of Stock Construction Corp.; Howard Gould of Spencer, White & Prentis, Inc.; and Robert C. Johnston of Moran, Proctor, Mueser & Rutledge.

Immerman, a native of New York City and resident of Larchmont, N. Y., was the Moles Member Award winner for 1961. He began his long association with Spencer, White & Prentis in 1923.

As first vice president, elected a year ago, Immerman has actually been top officer of the Moles since the death last September of Chester W. Cambell, the 1960 president.

Services Held for H. A. Titus

Harold A. Titus, 64, a district sales representative for Bucyrus-Erie Co., South Milwaukee, Wis., died May 8 in Kansas City, Mo., after undergoing surgery.

Mr. Titus was a well-known figure in mining, quarrying and construction circles in the Midwest since 1926.

H. A. Titus

He was a salesman for the Erie Steam Shovel Co., Erie, Pa., 1922-26 before it merged with the Bucyrus Co. to form Bucyrus-Erie. He was district manager at the Detroit (Mich.) sales office 1926-30. He served at the South Milwaukee home offices 1931-32. From 1933 until his death, he was in charge of the Kansas City sales office.

He was a member of the Engineer's Club of Kansas City. He was also a member of the Keystone Lodge, F.&A.M., at Erie.

Services were held at Kansas City May 11. Mr. Titus is survived by his wife, Barbara; a son, Harold A. Titus, Jr., Los Altos, Calif.; and a daughter

Mrs. Jeanne Truett, Los Angeles, Calif.

Mr. Titus was best known for his wide knowledge of the stripping shovels and draglines and their field applications in the mining and quarrying industries. He was instrumental in placing in the field numerous large excavating machines including the new 1054-WX wheel excavator at River King Mine of Peabody Coal Co. at Freeburg, Ill. He also participated in the negotiations for two model 3850-B stripping shovels with 115-cu. yd. dipper capacity which Peabody will assign to strip mines in western Kentucky. Most recently, he handled negotiations for a 90-yd. model 1850-B shovel which Pittsburg & Midway Coal Mining Co., Kansas City, will place in one of its mines.

One of his chief personal assets was his reputation for service to pit operators and contractors. He held his personal life secondary to serving the best interests of the excavating industry.

Small Contractors Active in Federal Road Program

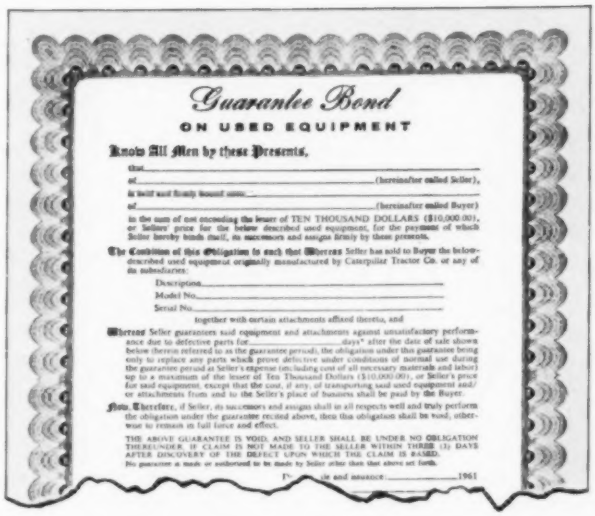
Federal-aid highway contracts totaled 7,098 in calendar year 1960, and involved a total cost of $3.1 billion, according to state highway department figures compiled by the Bureau of Public Roads, U. S. Department of Commerce, Washington, D. C. Here is a comparison of the figures for 1960 with those for prior years:

Year	Number of contracts	Value (billions)	Average contract
1957	7,386	$2.4	$325,000
1958	11,102	$3.8	$340,000
1959	6,743	$2.5	$370,000
1960	7,098	$3.1	$440,000

Although contracts averaged larger, Federal Highway Administrator Rex M. Whitton, reported that a large proportion of the federal-aid contracts awarded in 1960 were sized for small business. About 79% of the total number of contracts awarded were for amounts less than $500,000 and better than 42% were for amounts less than $100,000. Whitton concluded that "the federal-aid highway program thus appears to be favorable to the existence and prosperity of both large and small contractors."

Average number of bids per contract declined somewhat, but continued keen competition among contractors is reflected in the figures showing that total low bids were more than 10% below the total of engineers' estimates.

This Bond Is an Investment in You



Guarantee Bond

ON USED EQUIPMENT

Know All Men by these Presents,

that _____

of _____ (hereinafter called Seller),

is held and firmly bound unto _____

of _____ (hereinafter called Buyer)

in the sum of not exceeding the lesser of TEN THOUSAND DOLLARS ($10,000.00), or Sellers' price for the below described used equipment, for the payment of which Seller hereby binds itself, its successors and assigns firmly by these presents.

The Condition of this Obligation is such that Whereas Seller has sold to Buyer the below-described used equipment originally manufactured by Caterpillar Tractor Co. or any of its subsidiaries:

Description _____

Model No. _____

Serial No. _____

together with certain attachments affixed thereto, and

Whereas Seller guarantees said equipment and attachments against unsatisfactory performance due to defective parts for _____ days* after the date of sale shown below (herein referred to as the guarantee period), the obligation under this guarantee being only to replace any parts which prove defective under conditions of normal use during the guarantee period at Seller's expense (including cost of all necessary materials and labor) up to a maximum of the lesser of Ten Thousand Dollars ($10,000.00), or Seller's price for said equipment, except that the cost, if any, of transporting said used equipment and/or attachments from and to the Seller's place of business shall be paid by the Buyer.

Now, Therefore, if Seller, its successors and assigns shall in all respects well and truly perform the obligation under the guarantee recited above, then this obligation shall be void, otherwise to remain in full force and effect.

THE ABOVE GUARANTEE IS VOID, AND SELLER SHALL BE UNDER NO OBLIGATION THEREUNDER, IF CLAIM IS NOT MADE TO THE SELLER WITHIN THREE (3) DAYS AFTER DISCOVERY OF THE DEFECT UPON WHICH THE CLAIM IS BASED.

No guarantee is made or authorized to be made by Seller other than that above set forth.

Executed and delivered _____ 1961

Signed by your Caterpillar Dealer, this bond gives you up to $10,000 worth of machine dependability

BONDED BUY

Bonded Buy means guaranteed machine dependability. You can get a completely-checked, used Cat-built machine that has the Cat Dealer's confidence and guarantee, PLUS this bond from Lumbermens Mutual Casualty Company that backs up your machine with as much as $10,000 worth of parts and labor for the period you and the dealer agree upon.

See your dealer. Read the bond. Check the details. This guarantee can apply on your next used machine. And you pay no extra premium for this assurance. Dependable Bonded-Buy machines are priced right—and your Cat Dealer offers terms to match your needs. Call him or see him soon. Do business with the man whose business is built on dependability.

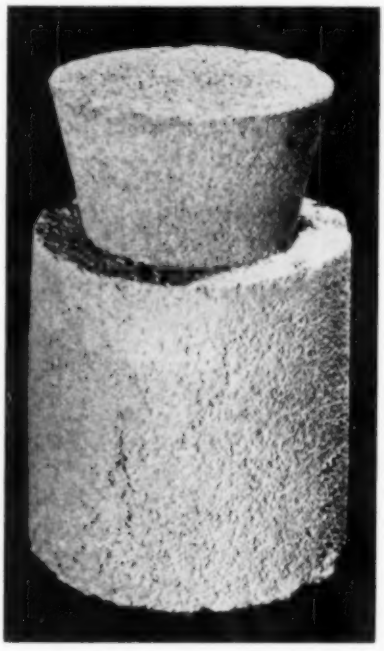
Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

EQUIPMENT YOU OUGHT TO KNOW ABOUT

Plug for Blast Holes Eliminates Tamp Bags



A new two-piece cast cement plug that saves time and expense of preparing tamping bags for large diameter horizontal blast holes is announced by Austin Powder Co. Called the Austin ATP plug, it consists of a cone and base which are loaded as a unit into the hole behind the explosive.

To obtain maximum confinement, the solid cone is tamped into the base unit and thus seated solidly in the blast hole. No additional stemming is necessary.

Besides saving time spent in filling bags, the plug is much easier to tamp. Also, because one plug eliminates the need for a number of bags, it proportionately reduces tamping time required.

The ATP plug is available in different sizes for holes from 4 to 10 inches in diameter. Cone and base are shipped and loaded in an individual polyethylene bag.

Manufacturer: Austin Powder Co., Department EE, Rockefeller Bldg., Cleveland 13, Ohio.

Power-Shifted Scraper

A power shifted 619 tractor-scraper, the Series C, with 280 maximum horsepower has been announced by Caterpillar. Major features include 18-cu. yd. heaped capacity; an all new design turbocharged engine; 30-mph road speed; air-actuated cable control; and a unitized body construction.

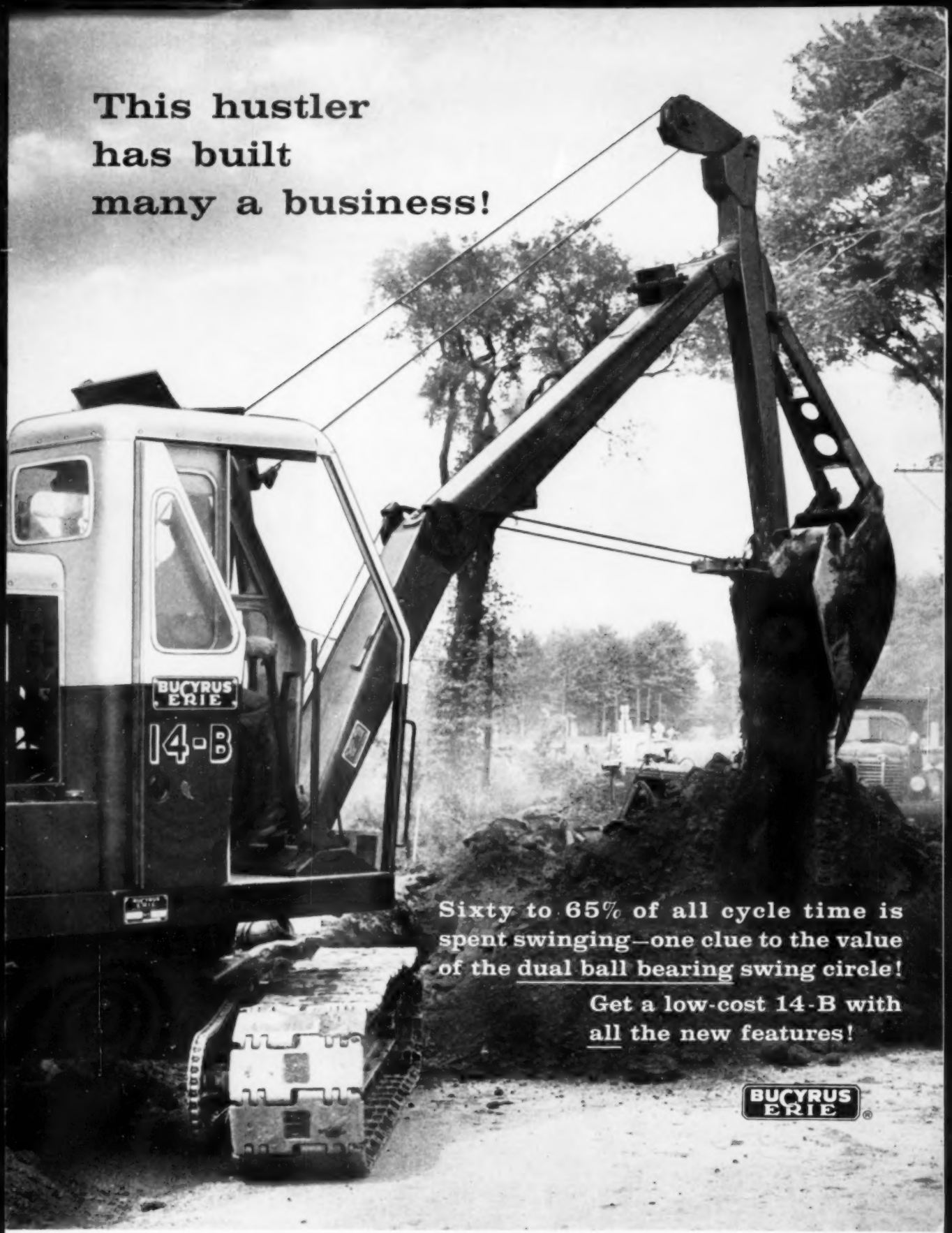
The torque divider power shift transmission, similar in design to the one used on 630 and 631 tractor-scraper units, provides nine speeds with only three operator "shifts." As load resistance is overcome, the transmission automatically shifts within each speed range from torque divider drive to direct drive to overdrive. Downshifting also is automatic in each range. To develop maximum rimpull at pusher matching speeds for fast loading, the unit can be locked in torque divider drive. A six-speed direct drive transmission also is available.

A new four cylinder diesel engine has been designed specifically for the 619C. It is rated at 250 flywheel horsepower.

The new, air-actuated cable control cuts operator effort in half and is live powered. Operator "feel" is retained. Larger tires (26.5 x 29, 22-ply) encourage higher speed operation over rough terrain because of increased flotation and ability to better absorb jolts.

Strong, weight saving HT steel is used extensively in the 619C scraper.

Manufacturer: Caterpillar Tractor Co., Department EE, Peoria, Ill.



BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin

14E61

95-Ton Capacity Truck

Following a year of engineering and testing, a new Dart 95-ton payload truck is now available to the mining industry.

In line with the trend set by Dart, the huge machine is a tractor-trailer combination. The dual tires used on the rear wheels of the tractor and trailer are 21:00 x 35 tubeless, 36-ply nylon cord. The front tires are 18:00 x 33, 32-ply tubeless nylon. According to the tire manufacturer, the rims are the largest demountable rims ever used.

The frame is unique in mining service. It is made up of four heat treated, pressed steel channels. Steel used has elastic limit of 110,000 psi. They are bolted together back to back, in pairs, forming an I-beam. The rails are variable in section depth, the greatest depth coming at the point of greatest stress. This construction was responsible for a sizeable saving in the tare weight of the vehicle.

The limiting factors in increasing the vehicle tonnage until recently have been the horsepower requirements and tire capacities. The diesel engine is a four cycle V-12 engine rated at 700 horsepower. Weight of the engine is 5,700 pounds, giving a horsepower to weight ratio of 8.1 pounds per horsepower. The 10 tires have a total capacity of 300,500 pounds. The vehicle tractor-trailer and body has a combined unladen weight of 120,000 pounds, permitting a payload of 190,-000 pounds.

Because of the 700-hp V-12 engine, each unit in the power train had to be designed for the 95-EDT. A 19-in. single-stage converter mounted on the engine delivers power to a four-speed power shift transmission equipped with an oil brake.

An 1850 Series drive line transmits power to the KW-Dart 140-S triple reduction planetary drive axle. This axle is a larger version of proved KW-Dart designs capable of handling the increased power and load with ample capacity to spare.

A twin telescopic, straddle mounted hoist operates at low pressures and features a power down body. The trailer rotates about the rear wheels when dumping.

Manufacturer: KW-Dart Truck Co., Department EE, P. O. Box 321, Kansas City, Mo.

Dragline

Hydraulic Fold-Away

Designed specifically for Caterpillar D4 Series C tractors, a new tractor-mounted all purpose ripper is now available from ATECO.

Heavy-duty construction, fast-acting hydraulic cylinders and a wide variety of shanks and replaceable points assure superior performance with complete dependability in all types of material.

Added features include a high lift tool beam for ripping the bank as well as the floor; pitch and depth adjustments for supplying the shank points with the correct digging angle at depths less than maximum; and a fold-away shank feature which keeps

Has Diesel-Electric Power

A model 210-B diesel-electric dragline and clamshell has been added to the Bucyrus-Erie line of heavy-duty crawler excavators. The machine, with boom lengths of 100, 120 and 140 feet, can handle buckets up to 10 cubic yards.

A key feature of the 210-B is the elimination of friction clutches for all cyclic functions. Hoist and drag or holding and closing motions are regulated by a static type control of independent electric eddy current clutches, which are liquid cooled by a radiator system. The swing motion is controlled by a variable Ward Leonard system.

Modern design and manufacturing techniques make use of alloy and Tri-Ten steels. Positive lubrication of gears and bearings is provided by oil pumps to assure adequate lubrication at all times. Unitized construction facilitates assembly and assures correct lineup of shafts and bearings. An elevated cab gives the operator an unobstructed view of work the machine is performing.

Three sets of crawlers are available —standard, intermediate and long-wide for soft ground conditions.

Manufacturer: Bucyrus-Erie Co., Department EE, South Milwaukee, Wis.

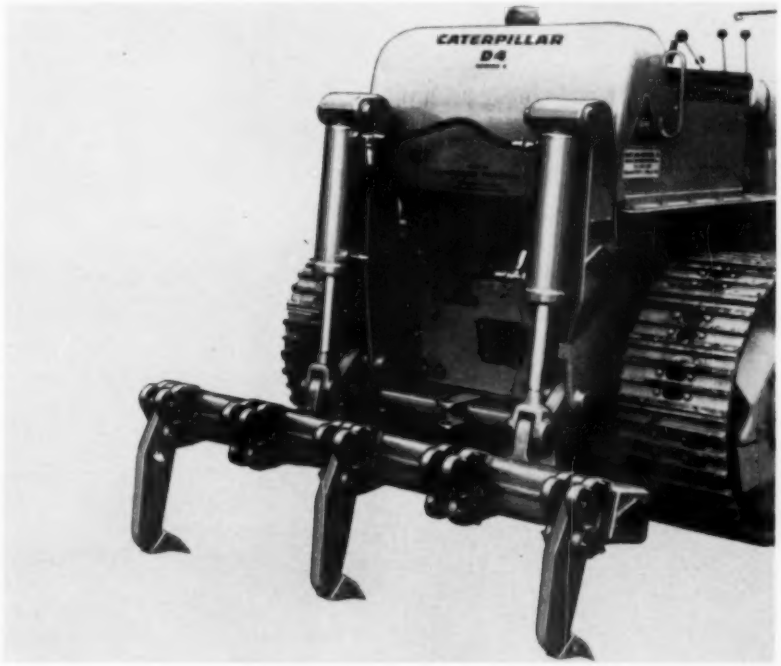
Prevent!
DYNAMITE BLAST VIBRATION
• DAMAGE
• COMPLAINTS, DELAYS
• UNJUST LAW SUITS, LOSSES
with your own
BLASTCORDER
• Designed especially for dynamiters.
• Even a housewife can understand the vibration reading on the meter. Meter helps blaster keep shots safe. Makes impressive demonstration indoors and outdoors to maintain good community relations.
• Pushing 2 buttons makes an immediate 4 x 5 record scaled like the meter — no photo processing, no delays, no computations. Helps satisfy complaints on the spot and prevent law suits. Invaluable permanent record for evidence.
• Rugged for field use. Weighs 20 pounds with batteries. Dimensions: 6 x 12 x 19 inches.
• Price: 1-component model $1225; 3-component model $1800. Records 30 cents each.
GEOTECH
The Geotechnical Corporation
3401 Shiloh Road, Garland, Texas
Phone BR 8-8102

Ripper Offers Shanks

dangerous points retracted out of the way, yet instantly ready for use without replacing the top pin in the shank holder bracket. The tool beam handles up to five shanks. Ripping depth is 14 inches for standard shanks; 18 inches is optional.

ATECO's new HR-D4W complements the line of general purpose, rock, pipeline and cable-laying rippers for all popular makes of crawler and heavy-duty rubber tired tractors.

Manufacturer: American Tractor Equipment Corp., Department EE, 9131 San Leandro Blvd., Oakland, Calif.



Time has brought decisive progress in the fight against cancer. Ten years ago one in four persons with cancer was saved. Today it's one in three. But time alone will not conquer cancer. Time plus research will. And research needs your dollars. Send your contribution today to "Cancer," c/o your local post office.

AMERICAN CANCER SOCIETY

New Equipment . . .

Loader Attachment for Lift Truck

A front end loader attachment with 1¼-cu. yd. (SAE rated) capacity is now being offered for the Kwik-Mix Hi-Lifter. Kwik-Mix is a division of Koehring Co., Milwaukee, Wis.

The front end loader attachment digs 94 inches wide, has 8½-ft. dumping height, 40° bucket roll back at ground level, 50° at dumping height, and 9,000 pounds breakout force. Maximum lifting capacity is 8,500 pounds.

The Hi-Lifter base machine offers all-weather, all-terrain 4-wheel drive traction; four equal size, big capacity, high flotation tires; and a power transfer differential.

Manufacturer: Kwik-Mix Co., Department EE, 235 W. Grand Ave., Port Washington, Wis.

Spray-On Thread Loosener

Whitmore's Mechanic's Thread Loosener is packaged in a 16-oz. push-button container for fast, easy application by mechanics anywhere. The new product quickly penetrates rust and corrosion to free tight or rusted pins, linkage, hinges, nuts, bolts, valves and other seized parts.

It is highly recommended for all climatic conditions to combat rust and corrosion even in salt atmospheres.

A free trial aerosol can of the Thread Loosener is available upon request by any interested company.

Manufacturer: Whitmore Mfg. Co., Department EE, Cleveland 4, Ohio.

THIS IS MARION QUALITY

Let's face it. After all the advertising claims...after the paper work...the cost-and-profit-per-ton analyses...the final acid test takes place here—on the job. So, let's take a look at Marion Quality in action. The job: A huge dam project. The machines: Four Marion excavators with a total dipper capacity of 48 cubic yards. The performance record: MORE DIRT WAS MOVED (BY THE LOAD AND HAUL METHOD) THAN ON ANY OTHER SINGLE EARTHWORKS JOB ANY PLACE IN THE WORLD IN A 24-HOUR PERIOD BY ONE CONTRACTOR! It only proves one inescapable fact. There *is* a difference between promising — and — delivering bigger profit margins. And that's true whether you're interested in high output, such as this construction job demands, or sustained performance on a low cost per ton basis in the copper and iron ore countries. We have the performance figures to back up both. Marion Power Shovel Company, Marion, Ohio. A Division of Universal Marion Corporation.

MARION

Dry-Type Air Filters Lengthen Engine Life

New Jersey Drilling Co., Netcong, N. J., one of the largest contract drilling organizations in the East, has a two year record of trouble-free service on all motive equipment using Purolator "two-in-one" dry-type air filters. The two-in-one filters replaced original single-element filters which failed on the job, causing complete destruction to four drilling-rig diesel engines.

High silica content dust from quarries passed through the original filters and the resultant abrasive action ruined the diesels. The two-in-one dry-type air filter was designed to protect equipment operating under abnormally heavy dust conditions. The unit consists of a large treated paper element which performs primary filtration and a smaller secondary element.

"An extensive drilling operation requires a continuous preventive maintenance program, and the dry-type filters are an integral part of this plan," emphasized Don McBride, general manager of New Jersey Drilling. "We have over $1 million worth of drilling equipment and, as a result, everyone in the company has become maintenance conscious," he added.

The maintenance program requires a complete overhaul for every engine on a two year or 5,000 hour basis. Each engine and compressor is continually protected during operation with a two-in-one dry-type filter which is checked every 500 hours of operation. "The primary element is usually clean at this check-up," McBride said, "but at the 1,000-hour service period the element is replaced even though it may not be necessary." The secondary filter is replaced at the two year or 5,000 hour service when drilling rigs are completely rebuilt.

According to the firm, the two-in-one filter has eliminated any apprehension regarding the efficiency of filter elements since maintenance men now have visual knowledge from the secondary element that no dust is passing the primary unit.

Manufacturer: Purolator Products, Inc., Department EE, Rahway, N. J.

Six New

Six new high-capacity trailers have been introduced by Athey. The redesigned line is based on new developments in the hauling field with attention concentrated on increased payloads.

A key factor in providing increased capacity and faster haul speeds in the new Athey trailers is the use of "T-1" steel. Athey trailers constructed of this new high-strength steel alloy, permit "thinner" body sections of greater strength than conventional steels, in turn reducing dead weight and making the greater payloads possible.

The new Athey line is now available through Athey-Caterpillar dealers. They include:

PR631—Teammate to the new 420-hp Cat 631 two-wheel tractor. The PR631 provides 40-ton capacity in a rear-dump trailer, travels up to 31.2 mph on the haul.

PR630—40-ton capacity rear-

PR 631

PR 619

PW 631

Athey Trailers

dump companion to the new 420-hp Cat 630 four-wheel tractor. Top speed is over 41 mph.

PR619—"T-1" steel rear-dump. Capacity is 25 tons. Teams up with the new Cat 619 two-wheel tractor.

PW630—Latest model of the bottom-dump trailer line, the new 32-yd. capacity PW630 teams with the Cat 630 four-wheel tractor.

PW631—Two-axle bottom-dump has three door dumping, "T-1" Steel construction. Powered by the Cat 631 tractor, the PW631 bottom-dump has a 30-yd. (struck) capacity.

PH630—Matched to the Cat 630 four-wheel tractor, this bottom-dump coal hauler has a 60-ton, 85-cu. yd. heaped capacity. Travel speed is over 40 mph.

Manufacturer: Athey Products Corp., Department EE, 5631 W. 65th St. Chicago 38, Ill.

PR 630

PW 630

PH 630

TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants

OPEN CHAIN LUBRICANT INCREASES CHAIN LIFE UP TO 300%

Penetrates, lubricates, prevents rust. Lubricates deep into chain linkage to reduce friction on pins, rollers, bushings, pressure surfaces. Corrosion inhibitor prevents rust in vital working mechanisms. Lubricates close-tolerance internal surfaces to increase chain life up to 300%. Highly recommended for all climatic conditions to stop rust and corrosion even in salt atmospheres.

Packaged in handy 16 oz. aerosol spray-on containers or in bulk—send for a free trial sample.

ANTI-FRICTION COMPOSITIONS HAVE NO MELTING OR DROPPING POINT

Packaged in 14½ oz. cartridges for handy application with lever-type cartridge guns for constant protection to roller, ball, sleeve bearings and sliding surfaces in "hot" bearing applications or in areas with high ambient heat. Exclusive formulas have no melting or dropping point; moisture resistant; will not wash out; exceptional metal adherence properties; temperature reducing qualities; high extreme pressure values. Available in two grades. Whitmore's Anti-Friction Composition No. 1 (light density), recommended for high speed, high temperature applications. Anti-Friction Composition No. 2 (heavy density), for low-speed high-temperature applications or loosely-fitted bearings. Specify No. when requesting free trial sample.

68 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

- Open Gears, Dipper Sticks, Cams
- Open and Enclosed Chain
- Speed Reducers
- Enclosed Gear Cases
- Roller, Ball and Sleeve Bearings
- Wire Rope and Cable
- Hydraulic Units, Torque Converters

Est. 1893

THE WHITMORE MANUFACTURING CO.

LUBRICATING ENGINEERS

CLEVELAND 4, OHIO • VULCAN 3-7272

Electric Submersible Pump

Gorman-Rupp has placed a new submersible pump in its line. The model 3VS1 is a 3-in. centrifugal powered by a 5-hp., 3,450-rpm, 60-cycle electric motor, and is available in three voltage selections—single phase, 230 volt; three phase, 220 volt; or three phase, 440 volt. A remote control box with overload protection and 75 feet of heavy duty electrical cable are standard equipment with each pump. The complete units weighs just 128 pounds and the pump only 95 pounds. The capacity range, 10 gpm at 120 feet of head to 300 gpm at 10 feet of head, is comparable to other makes using larger motors. Exclusive designing places motor and seal in separate, oil-filled areas of pump housing. The pump may run in complete safety, unattended, even if the hole runs dry.

Manufacturer: Gorman-Rupp Co., Department EE, 305 Bowman St., Mansfield, Ohio.

LITERATURE FOR EARTHMOVERS

Subject: **Heavy-Duty Compressor**

Content: New power and new size is offered in the model WFO air compressor introduced by Gardner-Denver. Offering new advance-

ments in air compressors, the WFO is the highest horsepower G-D machine available in the vertical W-type configuration. The 250-hp unit operates at 1,160 rpm with a piston displacement of 1,395 cfm, at maximum pressure of 125 psi. The two-stage compressor has aluminum pistons and high speed valves. Complete compressors are available with Super V-belt drive, built-in motor or direct connected motor. Ask for bulletin 1-1V.

Where to get: Gardner-Denver Co., Department EE, Quincy, Ill.

Subject. **Boring Equipment**

Content: The complete line of Ka-Mo earth and rock boring power transmission units, auger sections and accessories is illustrated and described in a 12-page brochure released by the Kwik-Mix Co. The two-color brochure covers air, hydraulic, electric and gasoline powered boring units; cutting heads; augers; feed tracks; and other accessories. Each model in the line is listed along with condensed specifications.

Where to get: Kwik-Mix Co., Ka-Mo Tools, Department EE, Port Washington, Wis.

Subject: **Wheel Loaders**

Content: An eight-page booklet, *Seven Years New*, describes the research and development program that went into three Cat wheel loaders—the 922, 944 and 966. Tracing the development of the wheel loaders, the booklet explains that the current line is a direct descendant of the cable Traxcavator. Design, engineering and research testing of the wheel Traxcavators introduced this past year were begun seven years ago, in 1953. Original drawings were made in late 1952, and a machine was "in the iron" by the end of that year. On-the-job testing began in 1959 with final checks evaluating customer response. Ask for form DE034.

Where to get: Caterpillar dealers or Caterpillar Tractor Co., Department EE, Peoria, Ill.

Subject: **Rotary Rock Bits**

Content: A 14-page illustrated bulletin describes Chicago Pneumatic's line of rotary three-cone air-blast bits, piloted reamers, drill collars, subs and related drilling equipment. The catalog also contains important casing data information showing bit sizes and clearances.

Where to get: Chicago Pneumatic Tool Co., Department EE, 6 East 44th St., New York 17, N. Y.

Subject: **Twin-Engine Excavator**

Content: A 16-page illustrated catalog describes the Manitowoc model 4500 Vicon, 6-yd. shovel or 7-yd. dragline. Featuring a new concept in the design of excavators—"variable independent control," the Vicon has integrated operating levers—they serve both as controls and as engine throttles, interlocked front and rear drums with double drum braking surfaces for dragline operation, and independent two engine power with torque converter drive. Cycle speeds are higher because machinery speeds are no longer limited by conventional clutch engagement speeds. The integrated controls and interlocked drums cut maintenance costs considerably as wear of clutch and brake linings is greatly reduced.

Where to get: Manitowoc Engineering Corp., Department EE, Manitowoc, Wis.

Subject: **Dragline Buckets**

Content: A 2-color, 4-page bulletin describes and illustrates the features found in Page 4 to 7-yd. buckets. The manufacturer offers the buckets in two groups: general purpose, designed for general contracting operations where a variety of types of material are encountered; and heavy-duty, constructed for digging in rugged material such as hardpan, blasted rock and shale.

Where to get: Page Engineering Co., Department EE, Clearing Post Office, Chicago 38, Ill.

Subject: **Submersible Pump**

Content: An 8-page, full color bulletin contains specifications, performance, a cross-section drawing, application and product pictures, and other general information on the Gorman-Rupp 3-in. electric motor driven submersible dewatering pump. Ask for form 1-VS-11.

Where to get: Gorman-Rupp Co., Department EE, 305 Bowman St., Mansfield, Ohio.

H&L

Teeth that really dig!

Pat. Nos. 2568075
2669153

FOR INTERMEDIATE EQUIPMENT (5 TO 7 YARDS)

THE NEW TACONITE POINT

UNEQUALED IN SERVICE AND PRODUCTION

A ONE PIECE FORGING OF NEWLY FORMULATED SUPER STEEL WITH UNIFORM GRAIN FLOW AND CONSTANT HARDNESS FROM CORE THROUGHOUT POINT GIVING EXTREME LONG WEAR WITH RESISTANCE TO IMPACT.

H&L has a point for every type of digging job, and for every make and model of digging equipment.

SEE YOUR H&L DEALER

H&L TOOTH COMPANY
1540 SOUTH GREENWOOD AVENUE
MONTEBELLO, CALIFORNIA

SPECIALISTS SPECIALIZING IN THE MANUFACTURE OF BETTER DIGGING POINTS FOR OVER 31 YEARS

TO ADVERTISE: All advertising in this section is payable in advance. Rate $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters. Count spaces and punctuation as one character each. Be sure to enclose the correct amount of money with your order. Rates and conditions subject to change without notice. Closing date—10th of preceding month. Example: January closes December 10th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the listed address. If box number is used, mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

HEAVY EXCAVATION EQUIPMENT
DRAGLINES, SHOVELS, CRANES,
DRILLS, TRUCKS

9-W B.E. Elec. Drag, 200', 8 yd. or 160', 10 yd.
9-W B.E. Diesel Drag, 165', 12 yd.
7-W B.E. Diesel Drag, 140', 7 yd.
7400 Marion Diesel Drag, 175', 13 yd.
7400 Marion Elec. Drag, 175', 12 yd.
625 Page Diesel Drag, 160', 9 yd.
631 Page Elec. Drag, 200', 8 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W B.E. Diesel Drag, 125', 6 yd.
2400 Lima Elec. Drag, 130', 6 yd.
2400 Lima Diesel Drag, 130', 6 yd.
7200 Marion diesel drag, 135' 5 yd.
4500 Manitowoc Drag, 120', 5 yd. & 140', 4 yd.
120-B B.E. Elec. Drag, 115', 5 yd.
71-B B.E. Crane with 160' boom.
3900, 3500 & 3000 Manitowoc Cranes.
111-M Marion Drag, 100', 4 yd.
1055 P&H Diesel Drag, 80', 4 yd.
1601 Lima 4 yd. Shovel/Drag.
1201 Lima Drag, 85', 3 yd.
54-B B.E. Drag, 80', 2½ yd.
5560 Marion 26 yd. Elec. Shovel.
5323 Marion 18 yd. Elec. Shovel.
190-B B.E. 8 yd. Elec. Shovel.
151-M Marion 7 yd. Elec. Shovel.
1600 P&H 6 yd. Elec. Shovels.
170-B B.E. 6 yd. Elec. Shovel.
4161 Marion 6 yd. Elec. Shovel.
2400 Lima 6 yd. Std. & H.L. Shovels.
120-B B.E. & 4121 Marion 4 yd. Elec. Shovels.
1055 P&H 3 yd. H.L. Shovel.
111-M Marion Std. & H.L. Shovels.
1201 Lima & 54-B B.E. Standard Shovels.
#6 Northwest 1½ yd. Standard Shovel.
Model T-650 REICHdrill Truck Mtd. Rotary & Down-The-Hole.
Ingersoll-Rand Truck & Crawler Mtd. Drillmasters.
Keystone #50 Truck Mt. Stardrill.
Euclid Trucks, Rr. & Bottom Dump; Dozers, etc.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton National Bank Bldg.
Hazleton, Pa. — GLadstone 5-3658

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Marion model 5561 stripping shovel, 120-ft. boom, 57-ft. 9-in. effective handle, 48-ft. 10-in. over-all length of crowd handle, 40 and 47-cu. yd. dippers. Location Middle West. Write:

EXCAVATING ENGINEER
Box 3767 South Milwaukee, Wis.

9-W electric dragline—located eastern United States. Excellent condition. Priced for quick sale. Write:

EXCAVATING ENGINEER
Box 3769 South Milwaukee, Wis.

Marion 482 #6353
Marion 4161 #8197
Bucyrus-Erie 54-B Diesel #103533

All equipment subject to prior sale. Contact:

PICKANDS MATHER & CO.
Purchasing Department
700 Sellwood Building
Duluth 2, Minn.

Bucyrus-Erie 200-W diesel dragline with 125-ft. boom and Cooper-Bessemer diesel engine. Two 6½-yd. and one 6-yd. Page buckets included. Spare parts available at reasonable price. Excellent condition. Located in Middle West.

EXCAVATING ENGINEER
Box 3771 South Milwaukee, Wis.

Bucyrus-Erie electric 120-B. Combination shovel-dragline. Located Anthracite region. Excellent condition. Priced to sell. For further information write:

EXCAVATING ENGINEER
Box 3764 South Milwaukee, Wis.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

EUCLIDS
Rear, Bottom and Scrapers

12-yd. Bucyrus-Erie dragline.
9-yd. Bucyrus-Erie dragline.
8-yd. Bucyrus-Erie shovel.
6½-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie dragline.
3-yd. Bucyrus-Erie shovel.
2½-yd. Bucyrus-Erie shovel and dragline.
1½-yd. Bucyrus-Erie shovel.
5-yd. Manitowoc shovels and drags.
6-yd. Lima dragline and shovels.
Large stripping shovels.
Other equipment available, not listed above.

WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Ave. Hazleton, Pa.
Phone: GLadstone 5-4041 or 5-0523

Bucyrus-Erie 170-B electric shovel. Located Anthracite region. Available immediately. Excellent condition. For further information write:

EXCAVATING ENGINEER
Box 3765 South Milwaukee, Wis.

Lima model 2400 dragline, 120-ft. boom, 7-cu. yd. dragline bucket, Cooper Bessemer STR-8 diesel engine. Air start auxiliary engine, light plant. Location western Pennsylvania. Write:

EXCAVATING ENGINEER
Box 3766 South Milwaukee, Wis.

Bucyrus-Erie model 750-B electric shovel with 95-ft. boom, 64-ft. handle and 12 cubic yard dipper. Some spare parts included. Location east central states. Write:

EXCAVATING ENGINEER
Box 3763 South Milwaukee, Wis.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

3½-yd. Bucyrus-Erie 71-B shovel s/n 120706 powered by GM diesel. 5,000-lb. counterweight—just like new. Less than 1,000 hours. Write

HOPKINS CONSTRUCTION CO.
1340 S. Lipan Box 1603
Denver 23, Colo. Great Falls, Mont.

51-B & 54-B OWNERS
New diesel engines Buda 60CB 1742 6½" bore, 8¾" stroke complete with radiator and clutch, $4,750.
New 60-ton Lowboy, $4,500.
Also, new 60A970 Buda diesel engines, $3,250.
Used 844 Buda, $1,000.

A. L. PEHRSON
Box 24104 Indianapolis, Ind.
CH 1-1469

IMMEDIATELY AVAILABLE

B-E model 120-B elec. shovel #46011 Westinghouse apparatus.
B-E model 120-B elec. shovel #58182 Westinghouse apparatus. (Machine #58182 includes dragline attachment)
B-E model 120-B elec. shovel #52553 G.E. apparatus.
B-E model 120-B elec. shovel #52555 G.E. apparatus.
B-E model 5-W dragline #609 diesel powered.
B-E model 5-W dragline #716 diesel powered.
Located in northeastern U.S.A., available for immediate inspection and delivery.
B-E model 200-W diesel dragline #735. Machine is presently located in Montana.

EXCAVATING ENGINEER
BOX 3760 SOUTH MILWAUKEE, WIS.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie model 15-B, serial No. 33505 with AC model HB351 gasoline engine, ½-cu. yd. hoe, 16" treads, standard crawlers. Currently being rebuilt in our shop.

Bucyrus-Erie model H-5 Hydrocrane, serial No. 119382, complete with tagline reel, ½-cubic yard GP clamshell bucket, mounted on ten-wheel International truck chassis. Entire unit sold new in 1959. Very low hours. Like new condition throughout.

Bucyrus-Erie model 22-B, serial No. 105975, with Caterpillar D318 diesel engine, 26" treads with 12'-0-⅜" crawlers. Any or all attachments available. Machine currently being rebuilt in our shop.

Bucyrus-Erie model 38-B shovel, Serial No. 73291 with Caterpillar D13000 diesel engine with gasoline starting engine with electric starter. 13'7" crawlers with 33" treads. Machine currently being rebuilt in our shop.

Bucyrus-Erie model 51-B 2½-yd. shovel, serial No. 62581, with Caterpillar D17000 diesel engine, standard crawlers with 36" treads. Low hours. Reconditioned and in very good condition throughout.

Lorain Model TL-25 ¾-yd. cambered boom backhoe with 3-71 General Motors diesel engine, extended crawlers, wide treads. Machine delivered new in 1956. Undercarriage rebuilt this year. Good working condition throughout. As inspected.$10,500

P&H model 255, serial No. 10784 ¾ cubic yard shovel with eight cylinder Chrysler engine. Appearance excellent. Good working condition throughout. Location—Watertown, Conn. "As is" $4,000

¾ cubic yard cambered boom backhoe attachment also available. Price $2,000

Koehring model 304, serial No. 8624 ⅜ cubic yard backhoe with International UD14 diesel engine. Good working condition. "As is" $5,000

Bay City model 65, Serial No. 4058, combination 1½-yd. shovel and 1¼-yd. hoe with Cummins diesel engine. $7,000 spent in repairs within past year. Good working condition throughout. As inspected ...$10,500

P&H truck crane, model 155ATC, serial No. 18206, 30' boom with clamshell equipment less bucket. Good condition throughout.

Lorain model L50K, serial No. 25389, Cat D318 diesel engine, extended crawlers with 30" treads, independent power boom hoist, 1-cu. yd. shovel front with AMSCO dipper. Other attachments available. Good condition throughout.

Bucyrus-Erie Hydrohoe Attachment for H-3 Hydrocrane with 18" general purpose dipper, 20" utility dipper. 12" narrow dipper and all neecssary fittings. Excellent condition $750

Bucyrus-Erie model 15-B shovel front complete with dipper trip, chains and lagging $1,200

Bucyrus-Erie model 22-B shovel front complete with dipper trip, chains and lagging. Good condition $1,500

Lorain ¾-yd. shovel front, Amsco bucket complete with dipper trip. Excellent condition throughout $1,500

Bay City model 45 ¾-yd. shovel front complete with dipper trip. Good condition. $1,500

BINDER MACHINERY CO.
Brighton St., Union, N. J.
MUrdock 8-0060

DRAGLINES

L-50 Lorain 1-yd., Cat D318, long crawlers, 50' boom. Serial 23596. Excellent.

15-B Bucyrus-Erie ½-yd., standard crawlers, 35' boom. Serial 49464. Fair.

K Insley ½-yd., gas engine, long wide crawlers. Serial 3879. Completely rebuilt.

GRADERS

Cat 12 S/N 9K5009, electric start., all four rear tires recapped.

Galion 118 S/N MD17985 IHC UD-16A diesel, power steering, operators cab.

ATTACHMENTS

51-B Bucyrus-Erie Shovel Front with 2-yd. dipper. No deck machinery. Unused.

22-B Bucyrus-Erie hoe (straight boom). Used.

15-B Bucyrus-Erie center section 15' long. Unused.

Lima 34 swing-type fairlead. Unused.

15-B swing-type fairlead. Unused.

POWER SHOVEL CO.
4913 Massachusetts Ave.
Indianapolis 18, Ind.

SMALL SHOVELS, CRANES DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 71-B shovel, GMC 6-110 engine, 3 cu. yd. Amsco bucket s/n 116168, located at Williams, Ariz. $70,000

Bucyrus-Erie 54-B shovel/crane, Buda 6DC 1879 engine, s/n 60319, located at Aurora, Colo. $28,000

Bucyrus-Erie 54-B shovel/crane, Buda 8DA 1125 engine, s/n 111968, located at Aurora, Colo. $33,000

Bucyrus-Erie 54-B dragline, Buda 6DC 1879, s/n 24654, located at Leesburg, Ala..$22,500

Manitowoc 4500 crane, 140' boom, Cat D397 engine, straight 48" clutch, s/n 4589, located at Leesburg, Ala. $135,000

Northwest model 6 shovel/dragline, model ME-6 engine, s/n 6827, located at Gallup, N. M. $17,000

Manitowoc 4500 shovel attachment, located at Boise, Idaho $30,000

INTERMOUNTAIN EQUIPMENT CO.
P. O. Box 1129 — Boise, Idaho
Phone: 3-6441

MOTOR GRADERS

Adams model 512 motor grader with 13.00 x 24 tires front and rear, cab, scarifier, lights, heater, defroster, windshield wipers, power steering, snow plow and wing. Engine overhauled recently. Price: F.O.B. Lansing $6,250

Austin-Western Master 99 motor grader, cab, windshield wipers, scarifier, lights. Price: F.O.B. Detroit $8,650

Adams model 610 grader, 14.00 x 24 tires front and rear, cab, scarifier, power steering. Price: F.O.B. Lansing $7,900

Caterpillar 112 motor grader, 13.00x24 tires, power steering, "V" snow plow. Serial #3US73. Price: F.O.B. Lansing.....$4,500

EXCAVATORS

Hopto Model 200TM demonstrator with heavy-duty boom, 24" backhoe bucket, 24" rotating clamshell bucket, Hopto cab and heater, 4 x 4 carrier, with cab, power steering, windshield washer, heater and defroster, fenders and running boards, front wheel locking device, nylon cord tires. Serial #3974. Price: F.O.B. Detroit..$15,000

Koehring ½-cu. yd. shovel, with GM 2-71 engine, 1948 model, rebuilt in 1956. Serial #C-6520. Price: F.O.B. Lansing.....$4,500

SCRAPERS-ROOTERS

LeTourneau-Westinghouse model "C" Tournapull with cab and 24" tires front and rear. #GT 4434. Price: F.O.B. Detroit. $12,000

LeTourneau-Westinghouse model "D" Tournapull, 18.00 x 25 tires front and rear. Price: F.O.B. Detroit $8,500

LeTourneau-Westinghouse model S3 rooter. Like new condition. For use with tractor of 50 hp or more. Price: F.O.B. Detroit. $1,000

LeTourneau-Westinghouse model "C" Tournapull w/P-19 scraper. Engine just overhauled. Serial #4477. Price: F.O.B. Lansing $13,500

LeTourneau-Westinghouse model "C" Tournapull w/P-19 scraper. Serial #4671. Price: F.O.B. Lansing $13,500

MISCELLANEOUS

Littleford model 115 Tankar Heater. Price: F.O.B. Lansing $950

Layne-Northern pump, capacity 1,200 gpm @250 feet, 100-hp electric motor, 200' casing, 21 pieces tubing and 21 pieces drive rod. Price: F.O.B. Detroit $2,000

LeTourneau-Westinghouse model "C" Tournapull w/P19 scraper. Price: F.O.B. Lansing $13,500

Warner & Swasey 36" push type rehandling bucket. Price: F.O.B. Detroit, Mich. .$400

Jaeger model BP5 bituminous paver, crawler-mounted, 6-cyl. Continental engine. Will pave up to 13' 6". Serial #51X234. Price: F.O.B. Lansing $3,500

TRACTORS

TD9 International crawler tractor with Bucyrus straight bulldozer blade. Good tracks, cleaned and painted. Price: F.O.B. Detroit $5,000

Used A-C model HD21A crawler tractor, serial #8483, with Garwood bulldozer. Rebuilt in the fall of 1960. Price: F.O.B. Lansing $15,500

TELFORD EQUIPMENT CO.
Detroit, Mich. — **Ph. WEbster 3-7330**
Lansing, Mich. — **Ph. IVanhoe 4-1468**

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

1—38-B shovel attachment, unused....$10,000

1—Blaw-Knox PF-90 bituminous paver, rebuilt $9,500

1—Barber Greene 879A bituminous paver $4,000

CLARK WILCOX CO.
118-124 Western Ave. — Boston 34, Mass.
Phone STadium 2-2320

Bucyrus-Erie 22-B shovel, Serial #81232, with Caterpillar D318 engine E3/4J3.

Bucyrus-Erie 19-B shovel, Serial #13016 with 22-B undercarriage, Waukesha Gas Engine J180, Serial #61320D.

Bucyrus-Erie 22-BTC #86258, with 60' boom and fairlead.

Lorain model TL20 serial #18174 backhoe with Waukesha Gas Engine 6BZ144E.

Model TU-3 Snogo snow plow, Serial No. 768, with Climax R-61 engine, Serial No. 15825, mounted on FWD truck.

Koehring model 205 shovel and hoe, ½-yd., Serial No. 5262C, powered with International gas engine #17366. 1948 model.

Model L-41 Lorain hoe with Waukesha gas engine. Serial No. 17832.

Unit model 1020 ¾-cu. yd. shovel, Serial No. 51256, powered with Chrysler gas engine.

K12 Insley ½-yd. backhoe, Serial #3671, powered with Buda engine.

CLYDE EQUIPMENT CO.
3410 First Ave., S.
Seattle 4, Wash.

AT DALLAS

Bucyrus-Erie dragline, 22-B S/N 114600, 35' boom, IHC diesel engine, reconditioned.

P&H dragline, ½-yd. S/N 59060, as is.

Quickway model E shovel, mounted on White tandem truck, as is.

Northwest model 25 backhoe, SN 111/313, GM diesel, reconditioned.

Northwest truck crane, model 25 S/N 11957, mounted on Dart carrier, good condition.

Northwest model 25 dragline, S/N 19078, 35' boom, Cat diesel engine, reconditioned.

Insley model L backhoe, S/N 7508, reconditioned.

Insley model L dragline and clamshell, S/N 7389 reconditioned.

Insely model K-12 dragline, S/N 1619, 35' boom, U9 IHC gas engine, fair condition.

Backhoe attachment for Northwest 25, good condition.

Shovel attachment for TL-25 Lorain, good condition.

Backhoe attachment for TL-25 Lorain, good condition.

Shovel attachment complete for LS-50 Link-Belt.

Shovel attachment for 362 Marion, 1½-yd., good condition.

AT HOUSTON

Bucyrus-Erie 10-B combination hoe and dragline, 14" track shoes, Hercules gas engine, as is.

Bucyrus-Erie 15-B dragline, S/N 114646, IHC UD-350, 35' boom, reconditioned.

Bucyrus-Erie 22-B dragline, S/N 56343, IHC UD-14, 45' boom, standard tracks, as is.

Bucyrus-Erie 22-B hoe, S/N 102692, standard boom, Cat D318, tractor-type tracks, reconditioned.

Insley model L dragline, S/N 7007, Cat D315, 40' boom, 30" track shoes, as is.

Lorain TL-20 dragline, S/N 15456, 35' boom, Cat D4400, 22" shoes, as is.

Northwest 25 dragline, S/N 11496, 30' boom, 28" shoes, GMC 3-71, as is.

Bucyrus-Erie hoe attachment (st. boom) for 15-B, as is.

Bucyrus-Erie hoe attachment, cambered boom, for 22-B, reconditioned.

AT BROWNSVILLE

Lorain 30, ½-yd. shovel, S/N 10198, gas engine, as is.

AT LUBBOCK

Insley K-12, ½-yd. backhoe, Hi-walker, good condition.

Bucyrus-Erie dragline, S/N 106001, 35' boom, Cat D318, std. flat tracks, good condition.

BROWNING-FERRIS MACHINERY CO.

Dallas, Texas
305 Exposition
TA 3-8121

Houston, Texas
2619 Texas Ave.
CA 5-3231

Longview, Texas
Highway 80
PL 9-2761

Lubbock, Texas
2424 Clovis Rd.
PO 5-7455

Brownsville, Tex.
3333 Boca Chica
LI 6-2121

SMALL SHOVELS, CRANES DRAGLINES — UP TO 2½ YDS.

TRACTORS

Cat DW20's—checked over and rebuilt—good rubber, new motors. Like new.

Cat D9, 18A direct drive-dozer and #30 C.C. Good operating condition. Real good running gear.

Caterpillar 14A and 13A series D8's with 8A angle dozers and No. 29 C.C. Real good operating condition and several completely remanufactured.

Caterpillar D4 tractors—wide and standard gauge. All with dozers. Checked over—all in operating condition—some rebuilt.

Caterpillar model D6 tractor, 9U series, 6A dozer. Double drum rear cable control. Guarded up and with operators guard. Undercarriage components 50% good. Good operating condition.

International TD-6, wide gauge, with new Holt free-spooling skidding winch, Holt hydraulic angle dozer, with front mounted pump. All the guards including overhead operator guard. This machine has been checked over and repaired as necessary. The appearance is very good. Is in good operating condition. The undercarriage averages 60% good $4,750

Caterpillar D6 tractor, 9U series, guarded up, good tractor or drawbar work $2,500

Allis-Chalmers HD6G shovel loader, serial No. 2254 with 1½ cubic yd. bucket. Worked a total of 3,600 hours since new. Engine completely rebuilt with new liners, pistons, bearings, and head. Checked over master clutch back including final drives, pins turned. Roller and idlers built, very good operating condition.

Allis-Chalmers HD5 shovel loaders with new motors and like new running gear.

Cat #955 75 H.P. shovel loader with 1¾-yd. bucket. Good condition.

International TD-6 with track, crankcase, radiator guards, operator guard. Straight hydraulic dozer. Checked over, repaired. $2,250

Oliver Cletrac OC-6 tractor with guard equipment, rear mounted skidding winch, Holt hydraulic straight dozer, front mounted on hydraulic pump. All steel operator guard. Good operating condition.

Caterpillar D4 tractor, 60" gauge, 7U series, with track roller guards, radiator crankcase guards, all steel operator guard, rails, rollers, idlers rebuilt, steering and master clutch final drives repaired. No. 4A angle dozer with No. 44 hydraulic control. Also equipped with a LeTourneau skidding winch. Excellent operating condition.

Caterpillar D2 tractor, with No. 44 Caterpillar hydraulic control and 2A Caterpillar dozer. Roller guards. Over $2,100 put into this machine in repairs. In excellent operating condition.

Caterpillar D2 tractor, 5U series with 5-roller non-oscillating frame. Equipped with a new Teale bucket loader, ¾-yd. bucket, running gear averages better than 60% good. The machine has been completely through our shop and engine completely rebuilt including a new block.

Cat #24 front cable controls. Operating cond. $500 and up.

Caterpillar #25 double drum cable control for D8 .....$1,000

Cat D7 angle dozers .....$400 & up

Cat 8A dozers—14A style $400

GRADERS & MISC. EQUIPMENT

Allis-Chalmers AD45 motor grader, late current model, tires better than 65% good, 13:00 x 24 rubber on all wheels, cab, cab heater, lights, scarifier, and 14' moldboard, all necessary repairs made, excellent operating condition. Used 35 months since new. Make an offer!

Adams #512 motor grader, diesel powered. 13:00x24 tires on all wheels, 12' blade, scarifier, cab w/heater, defroster. Good running condition $3,500

Adams #511 motor grader, diesel powered. Blade, scarifier, and cab $2,500

Wooldridge pull-type ripper for use behind D7 or D8, 2-teeth equipped with new shanks adaptors, and points, over $500 in repairs put into rebuilding this ripper.

LeTourneau No. H3C ripper, equipped with two teeth, two tips 50% good. Balance of ripper in good condition and complete with cable.

Carco GY-54 towing winch, 4HD10 or D7 tractors.

Isaacson heavy duty towing winch for D7 tractors.

Hyster Hyspeed skidding winches $500 & up.

Compressors—Stationary and portable, various sizes, good general condition.

Barber-Greene model 840B—60 ton per hr. hot plant.

Barber-Greene model 82A heavy-duty paving machine with floating clean-up scraper 14" x 6'5" crawlers, multiple speed-up, notched spirals, 72 horsepower, UD9A International diesel engine. Heavy drive.

Gardner-Denver 105 cubic foot per min. Air compressor, trailer mounted. Good condition $2,250

Pioneer 6-ft. x 30-in. type A, 2-chain with flared sideboards, apron feeder, appears like new. Sells for $2,450 new. Used only 90 days $1,800

Galion 10-ton 3-wheel steel roller, powered with Buda gas engine, engine has been completely rebuilt. Front wheel repaired. Checked and repainted. Put over $1,200 into repairs. Good operating condition. 30-day guarantee $3,750

SHOVELS

Bucyrus-Erie 22-B with 50' crane boom and extra counterweight, tagline. Powered with Caterpillar D318 diesel. Mounted on Maxi carrier w/8 14:00 x 20 tires. Rebuilt completely in our shops.

Bucyrus-Erie 51-B 2-yd. shovel powered with a Buda diesel. Good operating condition. Rebuilt tracks.

P&H ¾-yd. shovel, equipped with a 55-ft. crane boom, extra counterweight, tractor type tracks with 20-in. flat grousers, powered with a Chrysler industrial gas engine, three-speed transmission on the upper works. General appearance good $6,500

-:- Call — Write — Wire -:-

WESTMONT TRACTOR CO.

150 E. Spruce **Missoula, Mont.**

P. O. Box 1445

Northwest 25 dragline with 40' boom, and IHC UD-14A diesel engine. Serial #11190. Price FOB Greensboro, N. C $8,500

Northwest 25 dragline with 40' boom, and Caterpillar D318 diesel engine. Serial #16215. Price FOB Greenville, N. C..$9,750

Lorain TL-25S shovel with Caterpillar D315 diesel engine. Serial #25164. Price FOB Charlotte, N. C. $8,000

Link-Belt K-580 2½-yd. shovel with Caterpillar D17000 engine. Serial #2733. Price AS IS, WHERE IS, near Greensboro $18,500

Allis-Chalmers TS-160 motor scraper. Serial #620. Price FOB Greensboro $20,000

E. F. CRAVEN CO.

Greensboro, N. C.

P. O. Box 3307 **515 S. Eugene St.**

"I could go for a cool, tall drink!"

BUCYRUS-ERIE 38-B

Heavy-duty lifting crane, powered by Caterpillar D326F diesel engine with torque converter. 110' boom, mast pendant suspension, 12-part tackle, 30' jib, boom stops. This machine is nine months old and can be bought for approximately 70% of the new price.

D. D. KENNEDY, INC.
P. O. Box 177
Bellwood, Ill.

Chicago: AUstin 7-4300
Suburban: LInden 4-5600

Bucyrus-Erie 54-B shovel #107758, Buda 6DC-1879 engine. Rebuilt.

Bucyrus-Erie 54-B shovel #51079, Buda engine model 6DC1879.

Bucyrus-Erie complete 54-B shovel attachment.

Caterpillar DW20 scraper #11C880, excellent condition.

Koehring WD-60 Dumptor #3231. Excellent condition.

W. I. CLARK CO.

P. O. Box 301 **New Haven, Conn.**

Tel. CH 8-2131

EXCAVATORS

Link-Belt LS-98 1-yd. comb. crane-drag-hoe Cat 318 diesel, 1955, long wide cats, 30" treads, 55' boom (30-10-10-5 with pendants), ex. ctwt., seal track rollers, ind. rapid boom, ind. swing and propel, power down main drum, swing brake, foot throttle, fairlead, near new cambered boom hoe attach. incl. 42" dipper, 2,900 hrs., $32,500.

Link-Belt K360 1½-yd. comb. crane-drag-shovel, Cat 13000 diesel, Twin Disc fluid-coupling, 1954, wide cats, 32" treads, 60-ft. boom (35-15-10 with pendants), 40' jib (20-10-10), ex. ctwt., ind. rapid boom, foot throttle, fairlead, tagline, 1¾-yd. shovel front (used 4 mos.) with Amsco dipper, 3,100 hrs., $42,500.

Rex 34E D.D. concrete paver, Cummins H6BI diesel, 1957, carbon and darex dispensers, saddle tanks, app. 2,000 hrs., new tumblers and pads, $35,000.

MISCELLANEOUS

2—Pushin' Cushin' attach. (hydraulic ram push blocks) with push arms, for Cat D9, can be adapted to D8 or equal, for non-decelerated scraper contact, originals traded for these latest models, used 3 weeks, each $4,400.

2—Bucyrus-Erie B250 modified scrapers, 25-30-yd., 24:00 x 33, 24-ply tires, excellent, each $15,000.

Pullman KS2000 modified scraper, 23-28-yd., 24:00 x 32 24-ply tires, excellent, $14,000.

Bros R67W 15-ton modified wobble wheel roller with (13) 7.50 x 15 4-ply tires, excellent, $1,200.

Cleveland 95 trencher, Buda HP326 gasoline with 8" and 10" buckets, 3½" side cutters, excellent, $5,000.

Jaeger 125 rotary portable compressor, 6 cyl. gas, wheel mounted with front dolly, hose reels, low hrs., excellent, $3,200.

Wagner Scoopmobile Mod. H, Chrysler IND6, ¾-yd. bucket, engine just rebuilt, $3,500.

Gar Wood-Buckeye Mod. 5 surface spreader, truck hitch, (4) pneu. tires, op. platform, 10' box and agitator, used 2 days, excellent, $1,200.

Clipper concrete saw, self prop., $500.

Hobart 300-amp portable welder, new 1960, app. 150 hrs., excellent, $1,000.

Dake press, 75-ton air hyd., new '60, $700.

Haiss 1½-yd. GP clam, excellent, $1,800.

Haiss ¾-yd. GP clam, rebuilt, $1,200.

Hendrix 1-yd. drag, perforated, with mang. chains and bridle, used 2 mos., $700.

Insley 2-yd. conc. laydown, excellent, $350.

Insley 1-yd. conc. laydown, excellent, $200.

Rex Spanall webb and plate girders, telescopic for concrete arches and decks, (52) 6' 6" plates, (52) 4' lattice, (52) 8' 6" lattice, tot. 156 pcs., $1,800.

Anchor chain 270', for mass land clearing, wt. app. 100# per ft., 2¼" dia. links, in (3) 90' lengths, swivel conn. and swivel ends, $1,000.

RAPONE CONTRACTING CORP.

399 Duffy Ave. **Hicksville, L. I., N. Y.**

WElls 1-2242

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

EXCAVATORS

1—Bucyrus-Erie 22-B, IHC UD-14A engine, 50′ dragline boom and fairlead. A clean serviceable machine.

1—Lorain TL-25, Cat D315 engine, 35′ dragline boom and fairlead, wide tread undercarriage. Can you use it? Will sell at bargain price.

1—Link-Belt LS-71, IHC UD14A engine, 45′ dragline boom and fairlead. A serviceable machine, priced to sell now.

1—Lima 604, Cummins HIS engine, 50′ dragline boom and fairlead. A fine rig, ready to go. Let's put it to work any reasonable offer favorably considered.

1—Quickway model "L", IHC U-9 engine mounted on FWD commercial chassis single rear axle, hoe, shovel or crane dragline and fairlead. A clean serviceable rig you will be proud of, don't pass it up.

1—Northwest 25, Cat D4600 engine, 35′ dragline boom and fairlead. An older model but serviceable as-is.

1—Bucyrus-Erie 38-B, GM engine with converter combination shovel and dragline. A late model, very good condition.

EXCAVATOR ATTACHMENTS

1—Lima 604 shovel attachment complete, good condition.

1—Bucyrus-Erie 22-B shovel attachment complete, good condition, ready to go. Can you use it? Send us your check—$500.

1—Bucyrus-Erie 120-B dragline attachment complete, fairlead and deck equipment.

1—Kiesler 2½-yd. type "H" clamshell bucket, rehandling type.

1—Bucyrus-Erie 30-B shovel attachment with 1-yd. dipper. Complete deck equipment, new, never used, substantial discount.

1—Bucyrus-Erie 15-B shovel attachment complete except minor parts, near new.

1—Lorain model 79 or 80 fairlead, very good condition. A rare bargain.

1—Lorain 20′ crane insert, 32″ box section square tubular frame, pin connected, with pendants. Excellent condition.

CRUSHING & ASPHALT EQUIPMENT

1—Standard Maintenance type asphalt distributor, model ST complete, trailer mounted, dual wheels, a serviceable unit cleaned and painted, ready to go to work.

1—Barber Greene 848 asphalt plant complete with power, steam generator, diesel electric set. A clean, serviceable plant. Write for details. This plant will be sacrificed this season if necessary. Interested?

1—Pioneer model 120-JS primary crusher 4 x 8 2-deck Mesabi screen, product and fines conveyor, 36″ x 30′ portable apron feeder, GM 6031-CLH 6-71 engine. Late model, excellent condition.

1—Cedarapids 4′ x 12′ double deck horizontal vibrating screen with 10 HP electric motor. Good condition. Priced to sell.

SCRAPERS

2—Euclid SS-24s, 33LDT tractors Cummins engine, torque converter, Torqmatic transmission, 32SH scrapers, excellent condition, good rubber, dependable production machines ready to go to work.

1—Euclid 23TDT tractor with 122-W bottom dump wagon, GM 6-110 engine, good condition, located near Los Angeles.

2—Euclid 14TDT tractors with 21SH scrapers, Cummins engines, fair to good rubber, serviceable machines.

3—Euclid 7TDT tractors with 14SH scrapers, good rubber, serviced, cleaned and painted, ready to go, priced to sell.

2—Caterpillar DW20's, late turbo charged engines, clean serviceable machines, ready to go.

2—LeTourneau model CR scrapers. Good operating condition as is, good rubber, bargains.

1—Allis-Chalmers TS-200 a recent model in good operating condition. Can you use it?

MISCELLANEOUS

1—Buda Westinghouse diesel electric set 220 volt, 3-phase, 60 cycle, 187.5-KVA. Complete new control panel, voltmeter, ammeter, frequency indicator and manual voltage control. Skid mounted, complete. Ready to go.

1—Electric machinery package generator 30KW, 480-volt, 3-phase, 60-cycle, 1,200 rpm. Use your power. A bargain.

1—Electric motor driven generator set. G.E. 225-hp, 230-volt, 60-cycle, 3-phase, 514-rpm motor. Borke type WB-60, 120-440 volt DC, 150 KW, 625-Amp direct connected generator. A bargain.

1—Single-drum electric hoist, gear driven with cone clutch and friction brakes. G.E. 3-hp, 220/440-volt motor.

THE COLORADO BUILDERS' SUPPLY CO.
1534 Blake Street — Denver 2, Colo.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

BACKHOE & CRANE

1—Link-Belt model LS-80 crane with 50′ boom, Rudomatic tagline, Buda gas engine, s/n 7074.

1—Link-Belt model LS-60, Buda gas engine, s/n 8128.

1—Bucyrus-Erie 10-B crawler-mounted backhoe, s/n 20429, powered by Buda model 326-hp. 6 cylinder gasoline engine, s/n 11579. Backhoe with 14′ boom, 4′6″ stick, 29″ wide bucket at side cutters with 3 teeth mounted on 9′ long x 7′8″ wide crawlers with 14″ pads.

1—Bucyrus-Erie 22-B ¾-yd. heavy-duty crane and clamshell with 45-ft. boom, Rudomatic tagline, long wide cats (12-ft. 9-in. long, 10-ft. 6-in. wide, 30-in. treads). General Motors diesel power, machine s/n 114843. Perfect condition.

BUCKETS

1—Erie ⅝-yd. rehandling bucket, s/n 10192P01. Good condition.

1—Owen type M size 126, ½-yd. general purpose digging bucket with teeth and counterweights, s/n 22355. Good condition.

MISCELLANEOUS

1—Wayne 36″ rider industrial vacuum pick-up sweeper, demonstrator.

1—CMC Jetcrete with all accessories. Excellent condition, practically new with all extra accessories.

1—Used Kennedy-VanSaun revolving scrubber screen, 48″ dia. x 21′ long, in excellent shape and complete with all new parts including extra scrubber sections and new sizing screens.

1—Clark 10,000-lb. fork lift, solid tires.

S. M. CHRISTHILF & SON, INC.
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Timonium, Md.

CLAMSHELL & CRANE

Lorain 820, 2-yd. clamshell, 65′ boom, pendant suspension, tag line, 34″ tracks, 15′ 6″ long undercarriage. Cat D13000 engine completely rebuilt and guaranteed. $35,000

Bucyrus-Erie 22-B clamshell S/N 69159, 35′ boom, tag line, Buda gas engine. Recond. $15,000

LOADERS

Caterpillar 977 Traxcavator 20A series, heavy-duty undercarriage, 18-in. tracks, elect. start, 2½-yd. bucket w/teeth, semi-cab. 30 day Bonded Guar. $20,000

Caterpillar #6 Traxcavator with 2-yd. bucket and teeth, oil clutch $5,000

Caterpillar 955 Traxcavator 12A series, 1½-yd. bucket w/teeth. Rebuilt. 30 day bonded guar. $15,500

SHOVEL ATTACHMENTS AT GREATLY REDUCED PRICES

Bucyrus-Erie shovel attachment for 38-B, complete with deck machinery and Esco 1¾-yd. dipper. Good cond.

Bucyrus-Erie tunnel shovel attachment for 38-B. Includes 15′ boom, 12′ handle, 1½-yd. dipper. Very good.

Lorain shovel attachment for model 820 complete with deck machinery and 2-yd. dipper. Good cond.

Fairlead attachment for Northwest #25. Good cond.

TRACTORS

Caterpillar D9 tractor, power shift, NEW 30-in. tracks, hyd. track adjusters, pull hook, canopy w/Cat dozer and Cat 29 PCU. Top shape. 30-day Bonded Guar. $13,000

International TD24, series 241, tractor, direct drive, cable bulldozer and double drum PCU $9,500

GRADER

Caterpillar 12 motor grader, 8T series, lights, power assist steer, scarifier, cab, 13.00x24 12-ply tires. Recond. 30-day Bonded Guar.

All Items Subject to Prior Sale.

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51-B HOE and DRAG Comb.

Bucyrus-Erie 51-B combination with backhoe and dragline fronts. 70′ boom. 3 yard Page bucket. Cat power with torque converter. Long, wide crawlers. 1957 machine and in A-1 condition.

POWER SHOVEL CO., INC.
4913 Massachusetts Ave.
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SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

CRANES—HOES

Bucyrus-Erie 22-B, S/N 11383, w/Cat D318 eng., ¾-yd. hoe, 26″ tracks, work order of $6,000. *CERT. BUY.* Reg. $16,500; terms and trade $14,850; cash and no trade $13,200.

Bucyrus-Erie 22-B, S/N 116767, w/Cat D318 engine, ¾-yd. hoe, 26″ tracks, work order $10,000. *CERT. BUY.* Reg. $16,500; terms and trade $14,850; cash and no trade $13,200.

Four Bucyrus-Erie 15-B machines, S/N 113582, S/N 114550, S/N 116616, S/N 117081. All equipped w/D315 engines, 20″ tracks, ½-yd. hoe, work order $6,800 per mach. *CERT. BUY.* Reg. $15,500; terms and trade $13,950; cash and no trade $12,400.

Unit 510 mobile crane, S/N 56129, w/Chrysler 16A eng., Challenger 6x6 carrier, ½-cu. yd. hoe. *As is.* Reg. $14,500; terms and trade $12,325; cash and no trade $10,150.

MISCELLANEOUS

Cat D7, S/N 17A8194, w/2 Lincoln Twin Arc welders tractor engine driven, Hyster D7N winch. *As is.* Reg. $19,500; terms and trade $16,575; cash and no trade $13,650.

Cat D7, S/N 3T24024, w/2, Lincoln Twin Arc welders and Cat D315 generators, oil clutch. *As is.* Reg. $14,000; terms and trade $11,900; cash and no trade $9,800.

American trailer equipped with tandem axle with 10:00 x 24 tires, 28′ 6″ bed, 5th wheel pin. Directional signals and lights. A good sound trailer for hauling a D6 or D7 size tractor. Tires are all serviceable. Flooring is also serviceable. S/N 5207. Certified Buy. $2,500, Tulsa. Discount for cash. No trade. Save $500.

Cleveland 320 trencher equipped with Cat D339 engine with gasoline starting engine, electric starting, Brownlipe model 3594 transmission, 40″ buckets, cutting width 49″, tractor type tracks with caterpillar grousers, 7′ side discharge conveyor, wheel type trencher. Checked over for good operating condition. S/N K258. As-Is. $27,500. Tulsa. No discount.

Buckeye model 12 trencher equipped with 15″ street pads, 11″ bucket width, 16″ cutting width, HP326 Buda engine, 24″ side conveyor. Machine has not been used since previous owner spent $1,065.93 to completely rebuild the engine. S/N 12-86. As-Is $3,000. Tulsa. Discount for cash. No trade. Save $900.

ALBERT & HARLOW, INC.
6501 E. Admiral Place — P.O. Box 15800
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CRAWLER TRACTORS

HD21 Serial No. 8695 with cable dozer and rear double drum power control unit. Rebuilt and rented.

HD21 Serial No. 11821 with rear double drum power control unit and cable dozer. Used three months only.

HD21 Serial No. 7116 with rear power control unit and push block. Rebuilt and rented.

SCRAPERS AND GRADERS

Two Allis-Chalmers TS260 motor scrapers. Serial Nos. 2557 and 2558. Both have been rented a short time since rebuilding. Very good condition.

Allis-Chalmers TS260 motor scraper. Serial No. 4161. This is a late model 260 with very little use.

Five Allis-Chalmers TS360 motor scrapers. Rebuilt and used as rental machines. Price reduced.

Allis-Chalmers AD3 motor grader Serial No. 1F539. Rebuilt, very good condition.

CRANES & EXCAVATORS

Northwest No. 6 combination hoe and crane. Only 3 years old. Excellent condition.

Bucyrus-Erie 22-B hoe. Has Caterpillar diesel engine. Rebuilt and now in very good condition.

Two Bucyrus-Erie 15-B hoes. Both rebuilt and in excellent condition.

MISCELLANEOUS

Barber-Greene black-top paver. Gas engine. Make an offer.

Cleveland 140 wheel-type trencher. 16-in. buckets, 21½-in. cut. Completely rebuilt.

Galion 8-12 ton tandem roller. Excellent condition.

D. D. KENNEDY, INC.
P. O. Box 177 — Bellwood, Ill.
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SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Lorain model TL-15, ½-yd. dragline with crawlers, 10′ long over-all, 8′ wide, 22″ pads, lattice type 35′ boom complete with Hendrix ⅝-yd. type LS drag bucket. Powered by Cat D-311 diesel engine with gas starting engine. Excellent condition. $8,500. FOB, Evansville, Ind.

Bucyrus-Erie model 22-B heavy duty dragline, clamshell, 60′ boom pendant suspension lifting crane, long and wide tracks, extra counterweights, 30″ treads, powered by IHC UD-525 diesel engine. Replacement cost $34,499.60. #3280. $22,000 FOB, Louisville, Ky.

Bucyrus-Erie model 30-B heavy duty crane, clamshell, dragline with long and wide undercarriage, 60′ boom, pendant suspended. Powered by International UD-525 diesel engine. Out of our rental fleet. $37,500 FOB, Louisville, Ky.

Lorain model L-41, ¾-yd. capacity, 45′ boom with fairleads, 33″ pads. Diesel D318 Caterpillar engine. 1956 model. Also includes ¾-yd. shovel front with Amsco bucket H&L teeth. $5,500 FOB, Louisville, Ky.

P&H model 255-A, ¾-yd. shovel, crawler mounted. Powered by Caterpillar model 315 diesel engine. #5918. Excellent condition. $8,500 FOB, Elizabethtown, Ky.

Schield Bantam transit crane mounted on 6x4 carrier, ⅜-yd. capacity, gasoline engine, 40′ boom with fairleads, out-riggers. Includes ⅜-yd. dragline bucket and ⅜-yd. clamshell bucket. Excellent condition. $12,500 FOB, Louisville, Ky.

Unit model 1020, ¾-yd. shovel, powered by GMC 3-71 diesel engine. #1207. $7,500 FOB, Middlesboro, Ky.

Unit model 514, ½-yd. shovel with Chrysler gasoline engine. #10920. $2,500 FOB, Paducah, Ky.

Lorain model L-820, 1¾-yd. shovel, crawler mounted. Powered by Caterpillar model D13000 diesel engine. Shovel in operating condition. #4037. $7,500 FOB, Elizabethtown, Ky.

Koehring ¾-cu. yd. shovel front #397. $750 FOB, Elizabethtown, Ky.

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Thank You

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

DRAGLINES

22-B Bucyrus-Erie, ¾-yd., G.M.C. 3-71 diesel engine, 12′ long crawlers, 26″ treads, 1948, crawlers rebuilt, fairlead, good condition.

45 Bay City, ¾-yd., Cat D4600 diesel engine, dragline fairlead, 45′ boom, long crawlers, 26″ treads, good working condition.

SHOVELS

22-B Bucyrus-Erie, ¾-yd., G.M.C. 3-71 diesel engine, 1948, 26″ crawler treads, crawlers rebuilt, machine in good operating condition.

29-B Bucyrus-Erie, 1-yd., Cat diesel engine, machine in very good condition, 1-yd. shovel dipper, $2,000 in extra parts included, priced to sell.

34 Lima, ¾-yd., Cat D318 diesel engine, machinery overhauled and in excellent condition, cab panels sandblasted and repainted.

375 American, ¾-yd. shovel, Waukesha gas engine, needs some work but would make a standby or extra shovel for limited loading. Cheap.

30-B Bucyrus-Erie, 1-yd., Cat. D-318 diesel engine, 1959, rental and demonstration machine in like new condition, discounted for rental use.

BACKHOES

38-B Bucyrus-Erie, 1½-yd., Cat D13000 diesel engine, 1953, long cats, 33″ crawler treads, 1½-yd., hoe dipper, overhauled in November, excellent.

30-B Bucyrus-Erie, 1 to 1½-yd. dippers available, Cat D318 or G.M.C. 4-71 diesel engines, rental and demonstration machines, excellent, discounted.

22-B Bucyrus-Erie ¾-yd., Cat D318 diesel engine, 1955, long crawler frames with 30″ treads, excellent condition, low hours, priced right.

LIFTING CRANES

357 Unit wagon crane, 7-ton capacity, Chrysler gas engine, machinery overhauled, cab panels sandblasted and repainted, excellent condition.

14-B Bucyrus-Erie truck crane, 6-wheel drive carrier, 60′ of hydraulic telescoping boom, outriggers with screw jacks and floats, a like new machine with a demonstrator discount.

"L" Quickway truck crane, 10-ton capacity, 80′ of boom and jib, heavy-duty 15-ton carrier, gas power in crane, front and rear outriggers, very good condition and priced to sell.

HYDROCRANE EXCAVATORS

H-2 2 ton capacity, mounted on I.H.C. truck chassis, rear hydraulic outriggers, telescoping boom, priced to sell at $2,000.

H-3 5-ton capacity, 1952, mounted on Ford truck chassis, operator's cab, tandem outriggers, telescoping boom, hydraulics overhauled.

H-3 5-ton capacity, telescoping boom, tandem outriggers, hydraulics overhauled, mounted on 6-wheel drive carrier, tagline reel and bucket.

See us for rental cranes and shovels. Bucyrus-Erie dragline buckets. Used booms and Buckets.

J. P. WAITE, INC.
3304 W. Pierce St. **EV 4-1900**
Milwaukee 15, Wis.

Bucyrus-Erie model 20-B gasoline shovel on crawler-type mounting, 7′ 11½″ overall width, 10′ 11½″ overall length, 16″ treads. Equipped with 35′ clamshell boom, sheaves, cables, electric starter and fully enclosed steel cab, but no clamshell bucket. Serial number 18744, purchased in 1940. General condition is fair. Price, $7,000.

EXCAVATING ENGINEER
Box 3770 **South Milwaukee, Wis.**

DRAGLINES & SHOVELS

P&H 255A ⅜-yd. dragline, 4-71 GM diesel.
American 375 ¾-yd. dragline, 3-71 GM diesel.
American 375 ¾-yd. shovel only, 3-71 GM diesel.
American 375 ¾-yd. backhoe, 3-71 GM diesel.
Link-Belt 75 ¾-yd. dragline, Cat diesel.
Northwest 25 ¾-yd. dragline, Cummins diesel.
Insley K12 ½-yd. dragline and backhoe, Waukesha gas engine.
Unit 614 ½-yd. dragline, Chrysler 8 gas engine.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Lorain ½-yd. shovel only, Waukesha gas engine.

Miscellaneous backhoe attachments and dragline buckets for sale. Most of these machines may be inspected in our Minneapolis yard. Also good selection of used low boy and tilt-bed trailers.

ASPHALT PAVING EQUIPMENT

Barber-Greene model 879 crawler-mounted asphalt finisher with extensions to 12-ft. paving width.

3—Barber-Greene 879A crawler-mounted Asphalt finishers with extensions to 12-ft. paving width.

Barber-Greene model 879B crawler-mounted asphalt finisher with extensions to 12-ft. paving width.

Barber-Greene model SA60 crawler-mounted asphalt finisher with extensions to 14-ft. paving width for large capacity trucks.

Finishers priced $3,950 and up.
For driveways, parking lots, highways

COMPRESSORS

Gardner-Denver 60-cfm portable, V4 Wisconsin engine.

Davey 60-cfm portable, V4 Wisconsin engine.

Smith 75-cfm portable, Chrysler 6-cyl. engine.

Gardner-Denver 105-cfm portable, Buda gas engine.

Gardner-Denver 125-cfm portable, Hercules gas engine.

Schramm 210-cfm portable, Buda gas engine.

Worthington 315-cfm skid-mounted, Hercules diesel.

Call or write

ZECO CO.
2929 University Ave. S.E.
Minneapolis 14, Minn.
FEderal 1-7971

MISCELLANEOUS EQUIPMENT

Fairbanks Morse 100-hp. 2 cyl. diesel engine in excellent condition, also Fairbanks Morse exciter, type MX frame, 7½ kw., shunt wound, 60 amp, 257 rpm, full load 125 volts.

Cyclone blast hole drill rig with tools, mounted on crawlers, has been used only year and half. Excellent condition, best offer.

ROBERT GOETZ
Box 36 **Ottawa, Ill.**
HE 4-3791

MOTOR GRADERS

Cat 12 motor grader equipped with cab, Behlen steering booster, 9:00 x 24 front tires, 13:00 x 24 rear tires, 12′ moldboard. Tires will average 50% of new. Machine has been through the shop, checked throughout and repaired for good operating condition. S/N 7T882. As-Is. $5,500, Tulsa. Discount for cash. No trade. Save $1,650.

Cat 12 motor grader equipped with booster steering, 13:00 x 24 front tires, scarifier. This machine has been operated on 2,580 hours. All tires are recapped. S/N 70D3859. Bonded Buy. $15,500, Tulsa.

Adams 550, S/N 4548, w/cab, scarifier, booster, $2,000 work order. *CERT. BUY.* Reg. $7,500; terms and trade $6,750; cash and no trade $6,000.

Adams 512, S/N 6027, w/scarifier, 13:00 x 24 tires. *As is.* Reg. $4,750; terms and trade $4,033; cash and no trade $3,325.

Austin-Western 99M, S/N H3818, w/scarifier, large front tires. *As is.* Reg. $4,500; terms and trade $3,825; cash and no trade $3,150.

PIPELAYERS

Cat MD8, S/N 2U11530, w/pipelayer and weights. Rebuilt, work order $6,500. *As is.* Reg. $12,500; terms and trade $10,625; cash and no trade $8,750.

Cat MD7, S/N 3T12124, w/pipelayer, boom and weights. Rebuilt, work order $4,076. *As is.* Reg. $13,500; terms and trade $11,475; cash and no trade $9,450.

Cat MD7, S/N 17A2243, w/pipelayer, boom and weights. Rebuilt, work order $3,000. *BONDED BUY.* Reg. $16,500. Terms and trade $15,675; cash and no trade $14,850.

IHC TD-18 pipelayer equipped with Cardwell pipelayers and counterweights. S/N TDR-15765T2. As-Is. $4,500, Tulsa. Discount for cash. No trade. Save $1,350.

MISCELLANEOUS EQUIPMENT

TRACTORS

Cat D9, S/N 19A866, w/push plate, #9 ripper, complete rebuild. *CERT. BUY.* Reg. $35,000; terms and trade $31,750; cash and no trade $28,000.

Cat D9, S/N 19A285, w/9A dozer, #30 C.C.U. Kelly ripper, $12,000 work order. *BONDED BUY.* Reg. $47,500; terms and trade $45,125; cash and no trade $42,750.

Cat D9, S/N 19A208, w/C frame and push cup; #29 C.C.U.; rebuilt eng., new crank shaft. *CERT. BUY.* Reg. $38,500; terms and trade $34,650; cash and no trade $30,800.

Cat D9, S/N 18A1615, w/9A dozer, #30 C.C.U., rebuilt eng. and undercarriage. *CERT. BUY.* Reg. $38,750; terms and trade $34,875; cash and no trade $31,000.

Cat D8, S/N 2U20285, w/8S dozer, #24 C.C.U., C.C. guard, pull hook. *As is.* Reg. $14,000; terms and trade $11,900; cash and no trade $9,800.

Cat D8, S/N 15A970, w/8S dozer, #29 C.C.U., work order of $6,500 on comp. rebuild. *BONDED BUY.* Reg. $26,000; terms and trade $24,700; cash and no trade $23,400.

Cat D7, S/N 11066, w/7A dozer, #24 C.C.U., Hyster D7D towing winch. Repair work order over $6,000. *CERT. BUY.* Reg. $17,000; terms and trade $15,300; cash and no trade $13,600.

Cat D7 equipped with Cat 25 CCU, 8S dozer, CC guard, pull hook, canopy, 46 hyd. control, top crank starting. S/N 17A11070. Bonded Buy, $19,500, Tulsa. Discount for cash. No trade. Save $1,950.

Cat D7 equipped with 7A dozer, Cat 24 CCU, Hyster D7N winch, CC guard, pull hook, electric starter for starting engine, 22" track. This tractor is in excellent condition. S/N 3T21567. Certified Buy, $13,500, Tulsa. Discount for cash. No trade. Save $2,700.

Cat D6, S/N 9U4466, w/6S dozer, #46 hyd. control, completely rebuilt. *CERT. BUY.* Reg. $9,500; terms and trade $8,550; cash and no trade $7,600.

Cat D6, S/N 8U5499, w/6S dozer, #46 hyd. control, completely rebuilt, work order over $7,500. *CERT. BUY.* Reg. $8,500; terms and trade $7,650; cash and no trade $6,800.

Cat D6, S/N 9U22673, w/6S dozer, #46 hyd. control, rebuilt eng. and final drives. *BONDED BUY.* Reg. $13,500 terms and trade $12,825; cash and no trade $12,150.

Cat D4, S/N 7U8713, w/4S dozer, #44 hyd. cont., rebuilt diesel and starting eng. *CERT. BUY.* Reg. $4,000; terms and trade $3,600; cash and no trade $3,200.

Cat D4, S/N 7U42560, w/4S dozer, #44 hyd. cont., 5-roller frame, 16-in. grousers. *BONDED BUY.* Reg. $10,500; terms and trade $9,975; cash and no trade $9,450.

Cat D2 equipped with Teale loader, electric starting, 12" grousers, 5 roller track frame, Teale hyd. system. Undercarriage has approximately 60% wear remaining. S/N 5U16141. As-Is. $4,500, Tulsa. Discount for cash. No trade. Save $1,350.

International TD-24, S/N TDC241-1332, w/S dozer, cable cont., hyd. ripper, eng. and torque converter rebuilt. *As is.* Reg. $16,500; terms and trade $14,025; cash and no trade $11,550.

International TD24, S/N TD241-10137, w/S dozer, cable cont. *As is.* Reg. $10,500; terms and trade $8,525; cash and no trade $7,350.

IHC TD-24 equipped with push plate, IHC rear DD P29 cable control, 24" track, CC guard, pull hook. In running and operating condition. Would be a good standby tractor for limited service. S/N TDE3824. As-Is $5,500, Tulsa. Discount for cash. No trade. Save $1,650.

IHC TD-20 equipped with IHC straight dozer, IHC P29 rear DD cable control, CC guard, pull hook, 22" track. This tractor has just come out of our shop. Undercarriage has 70% wear remaining. S/N TD200661. As-Is. $13,500, Tulsa. Discount for cash. No trade. Save $4,050.

IHC TD-18 pipelayer, equipped with Cardwell pipelayers and counterweights. In addition to pipelaying, this unit would be an excellent machine in riprap operations for lowering trucks down the slope. S/N TDR25521, As-Is. $4,500, Tulsa. Discount for cash. No trade. Save $1,350.

International TD-14, S/N TD142-43187, w/S dozer, hyd. cont., (tilt type), 1,850 hours. *CERT. BUY.* Reg. $9,500; terms and trade $8,550; cash and no trade $7,600.

Allis-Chalmers HD-11, S/N HD11 B3656, w/A dozer, hyd. cont., 20-in. grousers, undercarriage and eng. have been rebuilt. *As is.* Reg. $9,500; terms and trade $8,075; cash and no trade $6,650.

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Rely on the bucket contractors rely on. The Omaha Dragline Bucket gives full load with every cast. Perfect balance makes it easy to spot dump. Alloy steel cutting teeth stay sharp, tough and ready.
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DRAGLINE BUCKETS

MISCELLANEOUS EQUIPMENT

LOADERS

Cat 977, S/N 20A2801, w/2¼-cu. yd. bucket and teeth. Rebuilt, work order $3,500. *CERT. BUY.* Reg. $16,500; terms and trade $14,850; cash and no trade $13,200.

Cat 955, S/N 12A740, w/1½-cu. yd. bucket, comp. rebuilt, work order $4,203. *CERT. BUY.* Reg. $11,500; terms and trade $10,450; cash and no trade $9,200.

Leroy Tractair, S/N 535894, w/loader, backhoe, and air compressor, all in one machine. *As is.* Reg. $2,500; terms and trade $2,125; cash and no trade $1,750.

SCRAPERS

Four Cat DW21 tractor-scrapers, S/N 86E4014, S/N 86E4021, S/N 86E4026, S/N 86E4066, w/470 scrapers. New in Sept., 1960, 1,200 hours average ea. All tires are good. *BONDED BUY.* Reg. $45,000; terms and trade $42,750; cash and no trade $40,500.

Cat DW20, S/N 21C356, w/#20 scraper, #27 C.C.U., excellent rubber. *As is.* Reg. $22,000; terms and trade $18,700; cash and no trade $15,400.

Cat 619, S/N 90E85, w/442 scraper, 300 hours, has been demonstrator. New warranty—*CERT. BUY.* Reg. $43,421; terms and trade $39,079; cash and no trade $34,736.

Cat DW15, S/N 76D701, w/428 scraper, #27 C.C.U., 1,500 hours. *CERT. BUY.* Reg. $27,500; terms and trade $24,750; cash and no trade $22,000.

ALBERT & HARLOW, INC.
6501 E. Admiral Place, Admiral Station — P.O. Box 15800, Tulsa, Okla.

Euclid loader, model 5 BV, 35-ft. conveyor, Cummins 165-hp engine, D8 Cat hitch, s/n 110.

H. J. WILLIAMS CO., INC.
150 S. Sumner St. — York, Pennsylvania
Phone 30021

MISCELLANEOUS EQUIPMENT

Parts For Sale

⅞-yd. dipper, dipper stick, and boom for Bucyrus-Erie steamer, serial 1543.

SESSINGHAUS & OSTERGAARD, INC.
Erie, Pennsylvania

TWO GANTRY CRANES

302'
Electrically powered, 440 volt
Transverse, horizontal and vertical travel
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NOTES FROM THE MANUFACTURERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed Martin-Roasa Tractor & Equipment Co., Cedar Rapids, Iowa, A-C engine dealer. The company will cover 76 counties in Iowa and eight in Missouri, selling and servicing A-C engine and power units, engine driven electric generating sets, products for the marine trade and for oil and gas field purposes. In another appointment, Ohio State Equipment, Inc., Columbus, Ohio, was named engine dealer for Allis-Chalmers in 38 Ohio counties. The firm recently became an A-C material handling dealer covering 14 central Ohio counties, and has been serving the construction industry in 26 counties of the state.

Eimco Corp., Salt Lake City, Utah, has announced the appointment of four additional dealers for its line of crawler-tractor equipment. Robert P. Stapp Machinery Co., with headquarters at Birmingham and branch offices throughout the state will handle sales and service in Alabama. Lake Shore, Inc., Iron Mountain, Mich., and Duluth, Minn., will handle sales and service within these and surrounding areas. H. C. Ormes Equipment Co., Minneapolis, Minn., and Andrews Machinery Co., Seattle, Wash., have been appointed to handle the complete Eimco line of tractors, dozers, front end loaders, excavators, log loaders and specialized steel mill loaders.

Koehring Div., Koehring Co., Milwaukee, Wis., has appointed Carroll & Edwards Co., Cincinnati, Ohio, distributor for southeastern Ohio. The firm will sell and service the complete Koehring line of construction equipment.

Leschen Wire Rope Div., H. K. Porter Co., Inc., St. Louis, Mo., has appointed William D. Messer as general sales manager. He was formerly sales manager of the construction division of Huck Mfg. Co., Detroit. A graduate civil engineer of the University of Illinois,

". . . The boss finally got off my back!"

Messer, 36, was a bridge engineer for the state of Illinois and was a consulting structural design engineer.

Macwhyte Co., Kenosha, Wis., has appointed William J. Anderson Chicago district sales manager for all its products. Anderson will headquarter at the company's Chicago offices and warehouse at 228 S. Desplaines St., and will be responsible for all sales in the Chicago territory. He was transferred from general sales to replace former manager George W. Drysdale, now retired.

McKiernan-Terry Corp., Harrison, N. J., has appointed E. H. Kliebenstein Co., Ridgefield, N. J., northern New Jersey sales and service representative for the McKiernan-Terry line of heavy construction equipment. The distributor will handle diesel, air and steam-powered pile hammers, pile extractors, pile hammer leads, sand drain equipment and accessories.

Stanco Mfgs. & Sales, Inc., Santa Monica, Calif., has named William S. Gaskill general sales manager. Gaskill will be responsible for sales of Stanco's complete line of Flygt submersible electric pumps, the HIAB 170 one-man-operated, fully-hydraulic truck crane, its smaller counterpart, the HIAB "Bimbo" 190, and Monark replacement running gear for crawler-type tractors.

Williams Bucket Div., Wellman Engineering Co., Cleveland, Ohio, has appointed Stuart Tyler as district representative to cover western New York, Pennsylvania, Ohio and West Virginia. Tyler has worked in construction sales for the past ten years in this area. He was formerly associated with Wepco Equipment Co., Cleveland.

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engine power

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Gardner-Denver's new SP900, a 900 CFM machine, is powered, as standard equipment, by the Cat D343 Diesel Engine. The SP600, a 600 CFM machine, is standard with the Cat D333 Diesel Engine. You get four-cycle design with full-stroke efficiency, plus full-length, watercooled cylinder liners for efficient cooling. Aluminum alloy pistons give low reciprocating weight, valve rotators distribute valve face wear and low-friction aluminum alloy bearings are known for superior strength and load carrying ability.

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For more information on this new concept in compressors, write to the Gardner-Denver Company, Quincy, Illinois. Your nearby Caterpillar Dealer can tell you more about Cat Diesel and Natural Gas Engine Power for every application requiring from 50 to 950 HP, or write to Department 516, Engine Division, Caterpillar Tractor Co.

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